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Vol. 57
No. 7

Canadian
Dental
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Canadian Dental Association
L'Association dentaire canadienne

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ART TO SCIENCE

As we enter the final decade of the 1900s and look forward to a new millennium, it is appropriate to reflect on progress in oral health research and the role that science will play in the future.

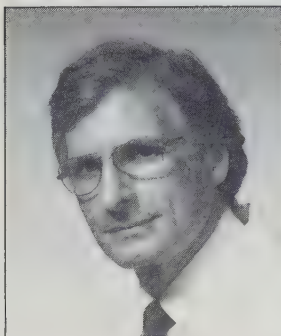
One often hears the phrase "the art and science of the practise of dentistry." Throughout the first 60 years of this century, however, the emphasis was on the art with very little understanding of the science. Dental diseases and abnormalities were like black boxes — they responded to certain treatments, but no one really understood why. Very little was known about the nature of dental disease and its causes. This lack of understanding precluded the development of preventative methodologies based on a knowledge of the underlying etiology of the diseases.

The situation changed dramatically with the discovery that fluoride, incorporated into the tooth structure, would impart a resistance to the acid dissolution of enamel. Subsequently, the widespread use of fluoride has led to a significant decrease in caries, and is one of the truly important successes in public health.

The development of dental research as a distinct branch of health science began when the education of dentists moved into the universities and became an academic discipline. At this time much of the basic science was taught by faculties of medicine while dental schools focused primarily on the development of clinical skills. As a result, relatively little dental research was carried out.

Fortunately, the 1950s saw the development of research units dedicated to the study of the biology of the oral cavity. This was followed by the formation of basic dental science departments, which are now frequently called departments of oral biology. In the process, people of diverse research interests were brought together to focus on biomedical dental problems that were either unique to the oral cavity or that could be best studied in the oral cavity.

The result has been an exponential increase in our understanding of the biology that underlies the development, maturation and diseases of the tissues and structures of the oral cavity. Like medicine, the study of the oral cavity has as its goal the improvement of health,



Barry C. McBride

the correction of abnormalities and the prevention of disease.

When dental research is viewed in these terms it can be classified as applied research with a well-defined goal. In order to achieve this goal it is essential to gain an understanding of the basic biology underlying such things as cell growth and development, the acquisition and maintenance of an indigenous microflora, the role of oral secretions and immune systems, the structure-function relationships between bone, tooth and muscle, and the

reaction of tissues to the administration of foreign substances.

As our understanding grows, so will our ability to apply this knowledge to improving oral health. Indeed, several areas of research will soon have a significant, exciting impact on the practise of dentistry. These include guided cell regeneration, in which it will be possible to utilize cell growth stimulating factors to encourage the regeneration of tissue lost to disease. In addition, advances in our understanding of oral microbial infections will soon lead to the treatment of caries and periodontal disease by monitoring and controlling specific pathogenic bacteria.

Similar dramatic advances are being made in many other areas of dental research, and it is safe to say that they will also have a dramatic impact on the practise of dentistry. It behooves the dentist to keep abreast of these developments and the exciting possibilities they present.

Canadians should be particularly proud of the contributions made by their dental researchers. Canadian dental research is recognized internationally for its quality and the important contributions it has and continues to make to the progress of dental health. This edition of the *Journal* highlights a number of areas where we have great strength, but is by no means all inclusive. I applaud the *Journal* for taking this step to bring together the practitioner and the researcher, and hope that it will be repeated in the future.

Barry C. McBride, B.Sc., M.Sc., Ph.D.
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RESEARCH IN DENTISTRY

The Canadian Dental Association has always considered the promotion of dental research an important part of its mandate. Incorporated into the 1902 founding Constitution was the understanding that continued research was vital to the realization of a long-term goal – the assurance that every Canadian had access to the best-possible oral health care.

To a large extent, we have met our research mandate through the *Journal*, which continues to be the only national, refereed dental journal published in Canada. Distributed monthly to dentists across the country since 1935, the *Journal* has consistently carried a broad spectrum of scientific and research-related articles. In effect, it has become the principal voice of the Canadian dental research community.

Despite our efforts, however, it took a long time for the dental profession – and industry, for that matter – to give research the attention it deserved. When I was studying for my master's degree, only a small portion of the graduating class was given the option of going into research. The field was small, and there were few employment possibilities.

Fortunately, that situation has changed. Today, almost every commercial undertaking has an established research and development program. It is now an accepted fact that it is impossible to remain successful unless a specified amount of research time and money is invested within an enterprise.

Therefore, it is equally fair to suggest that the dental profession will only maintain its current level of public respect through continued research endeavor. To put it another way, a good dental research program is synonymous with a healthy profession.

This is why CDA should become even more involved in the promotion of research across the country. Our Sydney Wood Bradley Library, recently enlarged and renovated, is already considered as a national dental resource centre. But CDA should become more than that, it should perform a data gathering and coordinating role for all dental research in Canada.

To promote this process, CDA will ask researchers across Canada to supply pertinent information about the various projects they are undertaking. This data – which will include the topic explored in each project, its cost, the amount of grant or foundation dollars that were made available to it, as well as the final results – will then be made available to the entire dental community.

By maintaining a complete record of the dental research conducted in Canada in any given year, we will ensure that researchers can avoid duplication. Before initiating



Gilles Dubé

a new project, a dental researcher, regardless of where he or she is located, will be able to determine if similar projects have already been undertaken and, if so, the results of those projects.

But the concept of CDA acting as a research resource centre goes further than this. We also need to develop a new and dynamic research model for dentistry. This model should touch on every aspect of the dental profession – from epidemiological studies to dental treatments. It should explore patient and dentist atti-

tudes, the dental needs of Canada's diverse communities and ethnic groups, dental treatment options, and the manpower needs of dentistry. Before we can do this, however, we must have all the necessary data in hand. It would be difficult, if not impossible, to plan the future of dental research without knowing what projects have already been undertaken and their costs.

Phase one of our new research initiative is almost ready. The Canadian Dental Association has applied to the recently established Canadian Dental Foundation for the necessary funding to launch this program in the near future.

Phase two, the development of a dental research model, is currently being explored by CDA's Professional Resource Utilization Committee. Possible courses of action include the establishment of an expert working group, which would draft the new model on behalf of the association.

By analyzing the funding history of dental research projects across the country, and developing a strategy for the creation of new projects, CDA will help to ensure the future of dental research. We will be able to approach government, industry, foundations and individuals with a clear perception of where we want dental research to go, and why. As a result, the *process* of obtaining new research funding should be made considerably easier. To be an effective negotiator, you need to know exactly what you want to achieve.

Obviously, it will take a substantial amount of time and significant funding to put CDA's new research initiatives into effect. I am confident, however, that we can be successful in convincing both government and private industry to participate in this exciting project if we can develop a creative funding process.

This fall's executive council planning session promises to be one of the most important ever – and research will be one of the priorities.

Gilles Dubé, DMD, MSc, Admin. Santé
President of the Canadian Dental Association

News Update

Dr. Dennis Smith Inducted into The Royal Society of Canada



Dr. Dennis Smith

Dr. Dennis Smith, director of the Centre for Biomaterials at the University of Toronto, was inducted into the Royal Society of Canada during a special ceremony at Queen's University in Kingston, Ontario, June 4, 1991.

Since its inception in 1882, the society has been dedicated to the promotion of learning and research in the arts and sciences, and is regarded as a force for the enrichment and strengthening of Canada's cultural and scientific heritage. Election to the society is one of the highest levels of recognition that Canada bestows upon its academics and scientists.

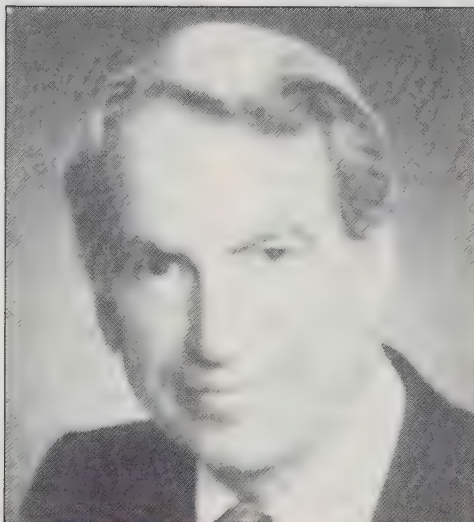
On the day of their induction into the society the new fellows promise to work for the good of the nation, to put their knowledge at the service of the governments and citizens of Canada, and to give advice and counsel on the noteworthy social, scientific and ethical questions of the day.

The Academy of Sciences — one of the three academies of the society, and the one that elected Dr. Smith to the august body — said in its citation of the new fellow: "Professor Dennis Smith is known for his distinguished research in the field of biomaterials, particularly as it relates to medical and dental surgery. Trained as a chemist, his early career was distinguished by the invention of the adhesive used in the famous "Charnley hip" prosthesis. This was followed by his invention and development of polycarboxylate cements, now used worldwide in dental surgery. He has served on the faculty of the University of Toronto School of Dentistry as a pro-

fessor of dental material sciences since 1969, one of the first such appointments made in Canada, and has been a world leader in his field since then. His many scientific publications relate particularly to the mechanical performance of a variety of dental and medical implants and devices, their compatibility with body fluids and tissues, and the development of improved designs for such purposes. He was the co-founder of the Canadian Society for Biomaterials and now serves as the founding director of the Centre for Biomaterials at the University of Toronto." Δ

(Further insight into Dr. Smith's career may be found in the September 1990 issue of the Journal, "Cementing the Future.")

Ontario Dental Association Honors Outstanding Members



Dr. Wesley Dunn

Hardwork and dedication to their profession have paid off for a number of Ontario dentists.

During its 124th annual convention, held May 4 in Toronto, The Ontario Dental Association (ODA) bestowed special recognition on association members who had made significant long-term contributions to dentistry. Dr. Wesley Dunn received The Honorary Membership Award, the ODA's highest form of recognition. Dr. Dunn has had a distinguished career as a dentist, administrator, teacher, journalist, and author. He was editor of the *Journal of the Canadian Dental Association* in the mid-1950s and the registrar-secretary treasurer of Ontario's Royal College of Dental Surgeons from 1956 to 1965. Dr. Dunn left that position to become the founding dean of the University of Western Ontario. He is immediate past president of the Royal College of Dental Surgeons of Ontario.

Three dentists, Drs. Bernard Dolansky, Marjorie Jackson and Kevin Roach, received ODA's Barnabus Day Award for Distinguished Service. Given in recognition of outstanding service, the award commemorates Dr. Barnabus W. Day, who is considered to have been the father of dentistry in Ontario. Dr. Day was instrumental in organizing the legislation which in 1868 laid the foundation for the regulation of dentistry in Ontario.



Dr. Bernard Dolansky

Both Dr. Dolansky and Dr. Roach are past presidents of the ODA with many years of contributory service to their provincial and national associations. Dr. Roach served as immediate past president of the CDA, and Dr. Dolansky is currently CDA vice-president.



Dr. Marjorie Jackson

Dr. Jackson, a 1938 nursing graduate, received her dental degree from the University of Toronto in 1950. She was instrumental in the development of both the undergraduate and graduate levels of

paedodontics in Toronto. She was also the director of the faculty's division of dental hygiene for 10 years.



Dr. Kevin Roach

During the ceremonies, **Lieutenant-Colonel Charles Hunt** received the Aileen Durham Award in recognition of an outstanding contribution by someone other than a member of the profession.



Lt.-Col. Charles Hunt

Lt.-Col. Hunt, who started as a messenger boy with Ash Temple Ltd. in 1933, has enjoyed a lifetime of service with the dental industry and the Canadian Forces. He was in command of the No. 2 army dental stores that landed in France shortly after D-Day. Following his discharge in 1946, Colonel Hunt returned to Ash Temple and was vice-president from 1970 until 1981. He joined Premier Dental in 1981 and "finally" retired in 1988. For many years "Charley" Hunt dedicated inestimable effort toward the Royal Canadian Dental Corps Association and was largely responsible for the group's continued success and influence. Δ

Orthodontists to Meet in Winnipeg

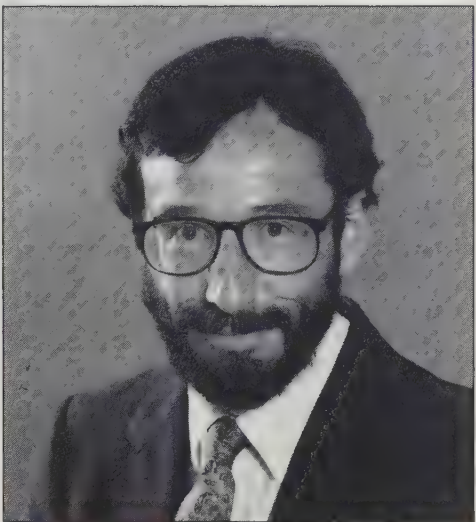
The Midwestern Society of the American Association of Orthodontists will hold its 1991 annual meeting in Winnipeg, Manitoba, September 15-17, 1991. Representing orthodontists from the province of Manitoba, North and South Dakota, Minnesota, Iowa, Nebraska, Wisconsin, Missouri and Illinois, the group has not met in Winnipeg since 1975.

The first day of the scientific program will feature two speakers, who will each present half-day lectures. Mr. Rick Walker will speak on the use of computers for orthodontic diagnosis and treatment planning, and Ms. Lynda Barbat will cover the legal aspects of orthodontic practice.

An all day forum on craniomandibular disorders will highlight the second day of the conference. Dr. Arthur Storey will chair the forum, with presentations by Drs. John Rugh, Charles McNeil and Ms. Lynda Barbat.

Further information may be obtained by contacting Dr. John Campbell at (204) 942-1667. Δ

Managing Editor Joins Journal Team



Terence Davis

There is a new name on the masthead of the *CDA Journal*.

Terence Davis, 36, has been hired by CDA to fill the newly created managing editor's position. In that capacity he will assist *Journal* editor Dr. P. Ralph Crawford with all aspects of the magazine's production.

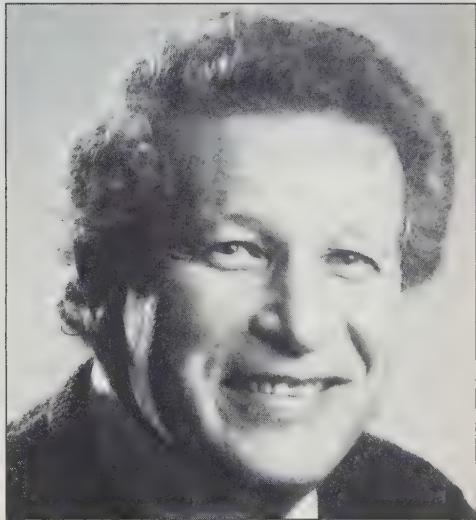
Mr. Davis, who joined CDA's staff May 2, was formerly the publications editor for the Atlantic Salmon Federation

(ASF), a non-profit conservation organization based in St. Andrews, N.B. Working out of Montreal, he produced ASF's quarterly magazine, the *Atlantic Salmon Journal*, as well its quarterly newsletter, *SALAR*, and its Annual Report. He has also held positions as the managing editor of *Canadian Thoroughbred* magazine and as a reporter-photographer for the *Morinville Mirror*.

"I am very happy to be here," said Mr. Davis. "My position with the *CDA Journal* promises to be both interesting and fun. I'm looking forward to the challenges it will provide."

Mr. Davis's objectives for the remainder of 1991 are to give the *Journal* a cleaner, more professional look — a process he initiated with the June issue — and to develop a new production strategy for the magazine. Δ

Dr. David Somer — ODA President



Dr. David Somer

Dr. David Somer, a private practitioner from Hamilton, Ontario, became president of the Ontario Dental Association May 4 during the ODA's 124th annual meeting. A 1965 graduate of the University of Toronto's faculty of dentistry, Dr. Somer was first elected to the ODA board of governors in 1987. Δ

Kerr Manufacturing Company Celebrates a Century of Service

Kerr Manufacturing Company marked its 100th year of service to the dental profession in 1991. Founded in Detroit, Michigan, in 1891 by two brothers, Robert and Thomas Kerr, the company first manufactured an ingenious gas-fired porcelain furnace and a series of different shades of porcelain for dental crowns and bridges.

At the time, it was Robert Kerr's task to sell the oven and porcelain to dentists. His sales pattern started a tradition that led to the company's 100-year-old success story.

Robert's strategy was to demonstrate the benefits of his oven and porcelain products as a unit — not as mere dental products, but as a means of providing better treatment for the patient. To this day, Kerr representatives have continued the tradition. They demonstrate and sell associated items that are designed to work together for quality dental care.



Journal Editor Ralph Crawford presents a copy of a 1941 advertisement to Mr. Brian Bremer, the president of Kerr Manufacturing Company — 50 Years of Support to the Journal and 100 Years of Service to Dentistry.

The current Kerr president, Brian Bremer — there have been only five presidents in the company's history — proudly told the *Journal* that the quality demanded by the Kerr brothers a century ago continues to pay dividends in 1991. Displaying products featured in Kerr catalogues almost 100-years old, Mr. Bremer explained that some of the items produced in those early years are still manufactured in volume today.

In 1898, for example, Kerr Impression Compound was developed to provide an alternative to plaster as an impression material. The company still sells over \$500,000 worth of the compound annually. At the turn of the century, Kerr introduced their first endodontic broaches and reamers. Once again, the company didn't sell just a product, but a technique that included all the accessory products necessary to bring a root canal operation to successful completion.

Similar innovations followed with the production of inlay wax (following Taggart's casting technique in 1908), and the development of Cristobalite investment materials in the early 1920s. To this day, Kerr is one of the world's largest suppliers

of investment materials to dentistry and the jewellery industry.

In 1937, Kerr introduced the first powder and liquid denture base material, a concept that would eventually replace vulcanite, celluloids and bakelite products. Again, maintaining the established tradition, trained representatives took to the road to demonstrate the "total" product to laboratories and dentists. But the company was involved in more than just dentistry. During the Second World War Kerr used its precision casting expertise to provide 5,000 critical radar parts per day for America's newly designed B-29 bombers.

Kerr's export business began during the depression of 1893, which was bad enough that it became known as the "Panic of 1893." Robert Kerr loaded a trunkful of his porcelain furnaces and powder and headed for Europe. For a year and a half he sustained his small Detroit factory with overseas orders. Today, Kerr Manufacturing Company, with headquarters at its modern plant in Romulus, Michigan, has branches in nine countries and exports to 60 others.

In recognition of Kerr's century of contribution and support to the dental profession, the *Journal of the Canadian Dental Association* presented the company with a framed copy of an advertisement placed in a 1941 *Journal*. The inscription reads:

*The Journal of the
Canadian Dental Association
Presents This Copy Of
A Kerr "1941" Journal Advertisement
In Appreciation For
50 Years of Support To The Journal
And*

100 Years of Service to Dentistry

We wish the Kerr Manufacturing Company well during their centennial celebrations and much success as they prepare for the next hundred years. Δ

Oral-B Launches New Brush

Oral-B Laboratories Inc., with headquarters in Mississauga, Ontario, will launch an innovative new toothbrush in Canada. Called the Oral-B Indicator, the brush has a patented band of blue dye located in the middle of the head, which gradually fades from the top down with repeated use. The Canada Food and Drug colorant, FD&C Blue No. 2 — the dye used in the new brush — is in common use worldwide in the food, drug and cosmetic industry. The colorant is reported to be harmless if ingested and will not stain teeth.

Mr. John Ford, president of Oral-B, said the new brush is the result of a three-year collaborative research and development

effort between Oral-B and its parent firm, The Gillette Company.



"When the blue fades halfway, the brush is signalling that it should be replaced," said Mr. Ford. "The problem is that most people do not replace their toothbrush every three to four months as recommended by dentists. In fact, most people in Canada replace their toothbrushes annually."

The total value of the toothbrush market in Canada is reported to be approximately \$42.4 million — or less than \$2 for every Canadian resident. Δ

Ralph Cain Appointed Marketing Manager for Teledyne Water Pik Canada



Mr. Ralph Cain

Mr. Ralph Cain was recently promoted to the position of marketing manager for Teledyne Water Pik Canada. Joining the firm in 1987, Mr. Cain had been the group product manager. Δ

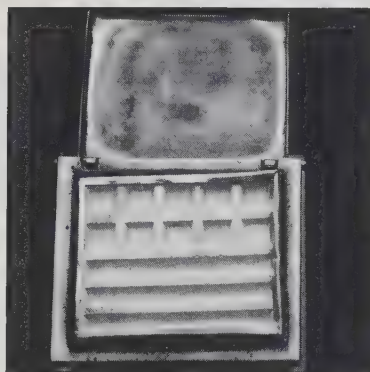


“WHAT’S IT?”

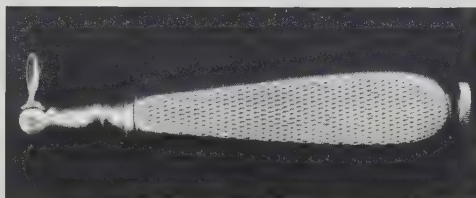
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and 8 cm high, this electrical
unit is constructed of chrome
with the rheostat mounted on
a marble base. The hinged lid
lifts to reveal oven compart-
ments. It was *not* used for
baking porcelain.

(Write to Dr. Ralph Crawford, Journal
Editor, 1815 Alta Vista Drive,
Ottawa, Ontario, K1G 3Y6.)

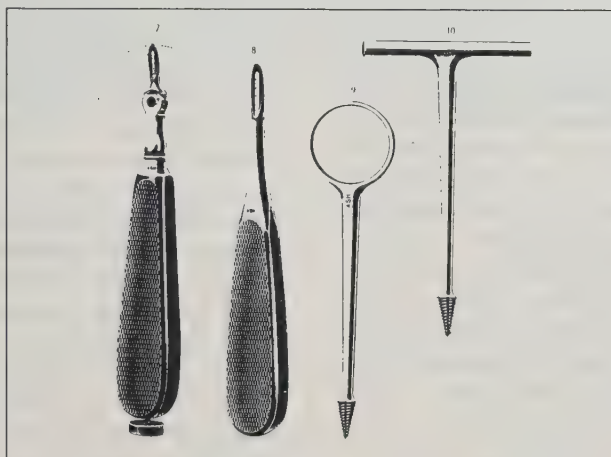


APRIL “WHAT’S IT?” SOLVED



Although a number of readers said the instrument in question was for detaching the ligament prior to an extraction, there were five correct answers identifying the instrument as an *adjustable root elevator*.

Many thanks to all who wrote in, but a special thank you to Dr. Anne Dale of Toronto, who sent a copy of a 1923 Claudius Ash catalogue featuring the adjustable root elevator.



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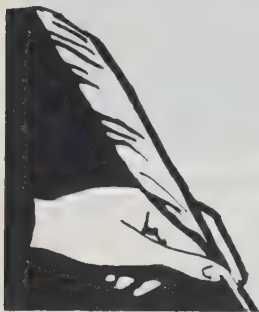
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Licensing and Accreditation

I congratulate the *Journal* for the valid summary, "Responsibility," that appeared in the February, 1991, issue.

In addition, I would strongly recommend agreement with Dr. Dubé's comments on licensure and accreditation in the same publication.

There are many reasons why some people may seek dental training outside Canada, but these people have to accept that there are different licensing provisions when they return. As someone who was trained in the United States, I accepted that there would be differences and made the appropriate arrangements when I returned to the country to practise.

The U.S. schools are not getting the numbers of American students they would like. In order to keep up their overall numbers and their faculty positions, they are filling spaces with foreign students provided those foreign students return to their home countries to practise. That way, the schools keep up their class sizes and their funding, which is calculated on a per capita basis, but they don't increase the supply of dentists in the U.S., which already exceeds the demand.

I believe it is accepted that doctors who are trained outside Canada must go through certain licensing examinations and processes before practising here, so the same should be true of dentists. Because the United States has a numbers problem, it should not become a Canadian problem.

I have always believed that the real problem is the payment of funds to schools based on the numbers of students. It is too bad that these payments could not be based upon quality of care. I think that would do a lot to eliminate the problems that we see. However, they exist, and Dr. Dubé is perfectly right in saying that it is human nature to only miss something after it is too late and we have lost it. Please let us not make this error. I would not say that this is only true of general dentistry, but also of periodontics and other specialties. I think it is important that

we keep our standard as high as possible now and in the future.

Malcolm Miller, B.Sc., D.D.S., M.Sc.,
Dip. Perio., M.R.C.D.(C)
Calgary, Alberta.



Placement and replacement of restorations in a military population

In the March, 1991, issue of the *CDA Journal*, Drs. W.A. MacInnis, A. Ismael and H. Brogan purport to study the reasons for "placement and replacement of restorations in a military population." Their findings reveal that caries are the major reason for the placement and replacement of restorations. This is hardly a surprising finding. In the introduction, the high cost of dental care for the insurance industry is mentioned and various hypotheses are discussed to account for the reported high rates of restoration placement. The lack of universally accepted replacement criteria to guide clinicians, gross inconsistencies among dentists, deficiencies in the dental school curriculum ("if in doubt fill or refill"), and financial pressures due to reduced caries rates and increased dental manpower are suggested as reasons to account for the placement of restorations by dentists. There is, however, absolutely nothing in the methodology or results of this study that would substantiate these assertions, nor was the study structured to prove or disprove these claims. Nevertheless, this has not deterred the authors from stating that "... dental schools have failed to train students in reliable and conservative diagnosis of the different types of carious lesions." I note that the authors are from Dalhousie University, and if one applied their leaps of logic it might lead one to think that poor research methods and diagnostic deficiencies were part of their school's curriculum. Clearly, the veracity of their assertions is completely unsubstantiated, casting a cloud of dubious credibility over their research. On the other hand, it does emphasize the validity of the article by Dr. Derek Jones, also of Dalhousie University, in the April, 1991, issue entitled "Giving Science a Bad Name."

Peter Fendrich, B.A., D.D.S.
London, Ontario

Authors' Response:

Dr. Fendrich misread statements made in the review of the literature as conclusions. In the introduction, several hypotheses made by other authors concerning the reasons for replacement of restorations were presented (references 8, 11, 12, 13, 14 in our paper). We never said that these hypotheses have been proven. The survey was designed to determine the frequency and reasons for the placements and replacements of restorations provided by salaried dentists with no direct financial incentives to place or replace restorations. Dr. Fendrich omitted the most important conclusion of the survey, namely the lack of support for the hypothesis that financial pressures lead to the high rate of replacements of restorations reported in the dental literature. The survey was not designed to validate the other reasons for replacements.

If Dr. Fendrich had read our paper objectively he would have noticed that there were several other important findings in addition to the one he quoted. The finding which he did not report is that 54 per cent of the restorations placed in "well-maintained" individuals in our survey were replacements of existing restorations. Another finding was that replacement restorations involved more tooth surfaces than newly placed restorations. Using these findings, we critically asked, in the discussion section, why these restorations were replaced and whether recurrent caries (the reason for 40 per cent of the replacements) could not have been prevented? Also, when should a restoration be replaced because of recurrent caries? And, why are there no widely accepted clinical criteria for the placement and replacement of restorations?¹ If Dr. Fendrich has the answers, we would appreciate it if he would agree to publish and debate them in the *CDA Journal*.

As for our statement concerning the failure of dental schools to train students in reliable and conservative diagnosis of different types of carious lesions, the discussion that occurred during a recent conference entitled "Criteria for placement and replacement of restorations" supports this statement.¹ Also, the discussion paper by Kidd³ succinctly presents the dilemma faced by clinicians in caries diagnosis around restored teeth. The diagnostic concepts of "explorer catching" and "stickiness," which were formulated in the early part of this century, have never been adequately validated. Research findings have

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shown that the sharp explorer is potentially damaging as it can cause cavitation of early carious lesions (dental caries is not synonymous with a cavity).²

As for Dr. Fendrich's "leap of logic," we are confident that this is not a scientifically valid approach, either. The research project we carried out substantiated the findings of a number of previous studies, and we find it quite revealing as dental educators. Should not dental professionals be concerned about why half of the restorations placed by dentists are replaced and why dentists spend a significant amount of time on re-treatment?

In response to his unnecessary and unprofessional attack on the faculty of dentistry of Dalhousie University, we would like to inform Dr. Fendrich that the faculty is taking the lead in discussing criteria of diagnosis of dental caries and other oral conditions, and we are currently conducting clinical projects to understand how restorative decisions are made. We would appreciate it if Dr. Fendrich would advise us on how to conduct "good" research.

We will be impatiently waiting for his advice.

We would also appreciate it if Dr. Fendrich would submit to the *CDA Journal* the criteria for the placement and replacement of restorations that he learned in dental school and that he is currently using in his private practice. We invite him to publish these criteria and to enter into a discussion and debate about their validity and reliability. If he so wishes, then he will join us in giving science a good name as a tool to be used for improving the quality of patient care. Will you accept the challenge, Dr. Fendrich?

References

1. Anusavice, J., Ed. (1989): *Quality Evaluation of Dental Restorations. Criteria for Placement and Replacement of Restorations*, Chicago, Quintessence Publishing Co., 1989.
2. Ekstrand, K., Qvist, V., and Thylstrup, A. Light microscope study of the effect of probing in occlusal surfaces. *Caries Res* 21:363-374, 1987.
3. Kidd, M., Caries diagnosis within restored teeth. *Oper. Dent* 14:149-158, 1989.

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BOUCHER'S PROSTHODONTIC TREATMENT FOR EDENTULOUS PATIENTS — TENTH EDITION

Edited by Zarb, Bolender, Hickey, and Carlsson

1990, C.V. Mosby Co., Toronto
623 pages, 979 illustrations, \$66.75

The revised, 10th Edition, of "Boucher's Prosthodontic Treatment for Edentulous Patients" continues to be an excellent textbook for dental students and should be of interest to dentists who provide complete denture treatment.

In the preface, the authors state: "The purpose of our book is to provide learning experiences that will correlate the basic behavioral and clinical skills of the dentist for the most comprehensive prosthodontic treatment of edentulous patients."

I believe that they have accomplished this objective with a well-written, well-illustrated and systematic approach to their subject. The technical aspects of the prosthodontic treatment of edentulous patients are described, along with the basic fundamentals that control them.

Despite the addition of Dr. Gunnar Carlsson to the editorial team for the 10th edition of the book, it follows the same format as the 9th edition, which was published in 1985. It is divided into five sections. Section 1 deals with the biomechanics and tissue response to complete dentures, and remains essentially unchanged in this new edition.

Section 2 addresses the preparation of the patient for complete dentures and has been updated with the addition of diagnostic charts, an expansion of the radiographic section, and the use of color plates depicting many different maxillae. There is also new information on communication and nutrition. In addition, the identification and management of patients with problems is covered in detail and, in my opinion, makes this text a welcome addition to any dental library. The material it addresses is applicable to all modalities of dentistry.

Section 3 is the longest section and deals with the rehabilitation of the edentulous patient. It describes several techniques for impression making and for the development of the occlusion.

Section 4 covers overdentures, immediate dentures, and single dentures opposing natural teeth, and is unchanged from the last edition.

Section 5 deals with relines, rebases, and repair procedures, and remains unchanged from the 9th edition. Dental implants are dealt with in this section, but they receive minimal attention. The text ends with the authors exclaiming that: "Branemark's work has led to a rapid development of different methods, materials, and applications in tissue integration, and that clinical prosthodontics has entered a new era of therapy." Perhaps it is time to integrate the use of implants and overdenture abutments more generally into the text.

Overall, this textbook remains a leader in its class and will serve as a valuable reference for anyone interested in prosthodontics, whether fixed, removable or maxillofacial.

This book was reviewed by:
Lawrence C. Gray, B.Sc. D.D.S.
director, Academy of Dentistry of B.C.
clinical lecturer, faculty of dentistry,
University of British Columbia

ANAESTHESIA FOR UNCOMMON DISEASES

by B.J. Pollard and
M.J. Harrison

1989, Blackwell Scientific Publications,
London, England, 271 pages

This 271-page, soft-cover, first-edition book covers over 200 medical conditions that could influence subsequent medical treatment, and, in particular, the provision of anaesthesia-related services. The authors claim that the purpose of the book is to draw together as much information as possible and place it in a single work. Indeed, the scope of the book encompasses most of the anaesthetic literature published between 1960 and 1987.

Each disorder described within the text is headed by a currently-recognized term, followed by a short list of the other names frequently encountered for that disorder. For example, where multiple sclerosis is the major heading, the other names given include disseminated sclerosis or demyelinating disorder.

Within the discussion of each disorder, the text is referenced directly to a list of references that appears at the end of each individual discussion. Most sections also include a brief list of sources entitled "Further Reading." Finally, each individual disease entity discussed is highlighted in a brief summary of three or four main points, emphasizing the major anaesthetic problems which may be encountered.

The authors emphasize that this is not an exhaustive text, and they are correct. I found many of the discussions to be incomplete, to say the least, and at times they were not particularly up-to-date. Several of the references cited were virtually 30-years-old. Again, the authors correctly emphasize that their intention is not to describe the only way of tackling a particular problem, but rather to inform the reader whether it has been done before and how it was done, and, finally, where a more complete discussion of the problem or technique can be found.

The book does indeed describe some "uncommon" disorders. It is probably unrealistic to expect a more detailed discussion of the pathophysiology of the individual disorders raised, or of the rationale for the treatments suggested, in a text of this size. However, I believe that these areas should be expanded. As it stands now, the book is of little more than superficial use to the reader.

Despite this, the text does contain some real gems and major points of interest. Still, the reader would gain far more value from a revised and significantly expanded version. Otherwise, much of his or her time will be spent looking up other articles, with this book serving as little more than a relatively weak reference source.

This book was reviewed by:
Earle R. Young, B.Sc., D.D.S., B.Sc.D.,
M.Sc., F.A.D.S.A.
Assistant professor and acting head,
department of anaesthesia, faculty of
dentistry, University of Toronto, and
The Wellesley Hospital, Toronto.

EVOLUTION OF THE SKULL, JAWS AND TEETH IN VERTEBRATES

by W.G. Young, R. Jupp and
B.J. Kruger.

1989, Department of Oral Biology and Oral
Surgery, University of Queensland, Australia
274 pages, illustrated.

The subject matter of this book is not usually considered to be of immediate interest to dentists, yet it is very significant for developing a full understanding of the jaws and teeth. Nevertheless, the teaching of evolution, comparative odontology and physical anthropology is not common in North American dental schools. It is, however, generally provided in the "British" system of dental education.

This text, written by three members of

the department of oral biology and oral surgery at the University of Queensland, Australia, is one of the only books available (and the only current one known to the reviewer) that is devoted exclusively to these topics. For that reason alone, it is a very welcome addition to the dental literature, providing a fairly up-to-date survey of its odontological theme. The book's 14 chapters discuss topics ranging from paleoclimates and the introductory principles of evolution to zoological classifications and the evolution of various structures of "dental" interest — the skull, temporomandibular joint and teeth. Comparative odontology and feeding mechanisms, primatology and paleoanthropology constitute further chapter topics.

This diverse but focused melange ought to whet the appetite of any enlightened dentist, yet should not cause indigestion, if the topics had been taught in dental school. It is for this purpose that the book has been written, and it provides a model of its kind.

The details of its contents are so disparate that no one author could authoritatively have covered so wide a range of topics, but the triumvirate of authors has skilfully blended their diverse interests into a cohesive, well-referenced text. The extensive lists of references are remarkably up-to-date, and the book is to be recommended for this feature alone. The numerous line drawings scattered throughout the text are professionally executed and highly explanatory of the sometimes abstruse concepts dealt with by the text. An insightful key to understanding these concepts is provided by a useful glossary of terms in one of three appendices, although appendix B curiously mentions non-existent "subsequent chapters."

While the contents and writing style are generally to be commended, the book would have benefited from the editorial edicts of a professional proofreader to eliminate inconsistencies (e.g. varying upper and lower case letter usage) and several typographical errors, particularly in the references, where authors' names are misspelled. These, however, are minor criticisms of a heroic effort to educate dentists with many fascinating tidbits regarding the complex biological structures that they manipulate for their daily living. I hope that many dentists will be tempted to enlighten themselves on these topics, which are so pitifully dealt with in North American dental education.

This book was reviewed by:
G.H. Sperber
department of oral biology
faculty of dentistry
University of Alberta

DENTAL OCCLUSION AND THE TEMPOROMANDIBULAR JOINT

by Albert Gerber and
Gerhard Steinhardt.

Translated by Robert Carmichael

1990, Quintessence Publishing Co., Inc.,
Chicago.

143 pages, Color illustrations, \$68.00 US

This book is a revised edition of the course documentation that accompanied the 1973 Swiss Dental Association Congress on Occlusion and the TMJ. It is designed to augment the dentist's knowledge and understanding of temporomandibular joint (TMJ) disturbances and to help in the treatment of patients with TMJ disorders.

The book starts with an interesting historical review of the inventions of Alfred Gysi, who, in the eyes of the authors, left behind a legacy that has provided the foundation on which prosthetic dentistry has been built. It goes on to describe the normal TMJ and introduces the reader to the Gerber condylar theory. The biomechanics of the TMJ are discussed in relation to the authors' belief that TMJ dysfunction may be triggered by an occlusally-related condylar displacement.

Various states of TMJ compression, distraction, and antero-inferior or posterior-inferior condylar displacements are dis-

cussed, giving the reader tips on causes, diagnosis and therapy. The book goes on to describe the structural development of the TMJ and contains some excellent color photographs of histological sections of the TMJ. The histological plates illustrate various pathological changes in the TMJ and are discussed in relation to the patient's radiographs and clinical condition. The resilience test, the Gerber Condylator articulator, the interpretation of diagnostic TMJ radiography, and theories of chewing dynamics are also described. At the end of the book, there is a list of mainly European references to accompany most of the chapters.

In conclusion, this book is based primarily on the authors' extensive clinical experience and provides an insight into European ideas on the relationship between occlusion and the TMJ. Chapters 7, 8 and 9 provide an interesting insight into the histological changes that may occur in the TMJ. This information and the information on the Gerber Condylator would be useful to a practitioner who already has some knowledge of articulators, occlusal concepts and treatment. However, this book would not be suitable to teach occlusion to a dental student.

This book was reviewed by:

R.B. Price

Associate professor, restorative dentistry
faculty of dentistry
Dalhousie University

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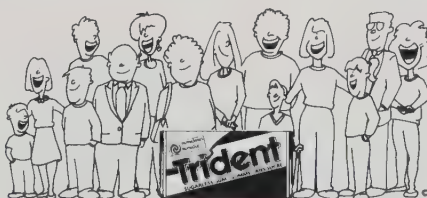
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1. Benjamin, L.S. "Versatility of the subperiosteal implant utilizing CAD-CAM multiplanar diagnostic imaging." *Journal of Oral Implantology*. 1987, v. 13(2), pp. 282-96.
2. "CAD/CAM: its effects on the practice of dentistry." *Journal of Dental Practice Administration*. Oct.-Dec. 1987; v. 4(4), pp. 172-4.
3. Crawford, R. "Computers in dentistry. Part one. CAD/CAM: the computer moves chairside." *Journal of the Canadian Dental Association*. Sept. 1988; v. 54(9), pp. 661-3.
4. "Dental technology: knocking at high tech's door." Mar. 1989; v. 118(3), pp. 285-8, 291-4.
5. Donlon, W.C. and others. "Three-dimensional computer tomography for maxillofacial surgery: report of cases." *Journal of Oral and Maxillofacial Surgery*. Feb. 1988; v. 46(2), pp. 142-7.
6. Duret, F. and others. "CAD-CAM in dentistry." *Journal of the American Dental Association*. Nov. 1988; v. 117(6), pp. 715-20.
7. Golec, T.S. "CAD-CAM multiplanar diagnostic imaging for subperiosteal implants." *Dental Clinics of North America*. Jan. 1986; v. 30(1), pp. 85-95.
8. Leinfelder, K.F. and others. "A new method for generating ceramic restorations: CAD-CAM system." *Journal of the American Dental Association*. Jun. 1989; v. 118(6), pp. 703-7.
9. Markowski, A. "A CAD-CAM ceramic inlay technique." *Journal of Esthetic Dentistry*. Nov.-Dec. 1990; v. 2(6), pp. 170-6.
10. Mormann, W.H. and others. "CAD-CAM ceramic inlays and onlays: a case report after 3 years in place." *Journal of the American Dental Association*. May 1990; v. 120(5), pp. 517-20.
11. Neuman, K.A. "Cosmetic imaging: a new level of communication." *Journal of Dental Practice Administration*. Jul.-Sep. 1990; v. 7(3), pp. 94-6.
12. Soh, G. and Keng, S.B. "Applications of computer technology in dentistry." *Annals of the Academy of Medicine, Singapore*. Sept. 1990; v. 19(5), pp. 720-3.
13. Takahashi, I. and others. "Application of video surgery to orthodontic diagnosis." *International Journal of Adult*

Orthodontics and Orthognathic Surgery. 1989; v. 4(4), pp. 219-22.

14. Watkins, C. "Computer imaging for the dental laboratory." *Trends and Techniques in the Contemporary Dental Laboratory*. Oct. 1990; v. 7(8), pp. 17-21.
15. Wicks, R.R. and Pennell, M.E. "Computer assisted design guide for removable partial denture frameworks." *Trends and Techniques in Contemporary Dental Laboratory*. Nov. 1990; v. 7(9), pp. 51-3.
16. Williams, A.G. "Dentistry and CAD/CAM: another French revolution." *Journal of Dental Practice Admin.* Jan.-Mar. 1987; v. 4(1), pp. 2-5.

Library Acquisitions

Books

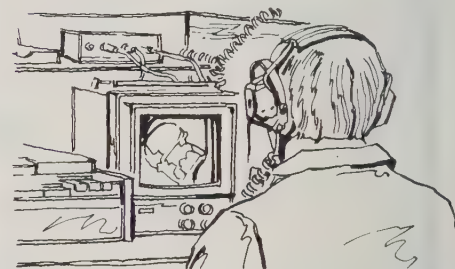
- Fédération dentaire internationale. *FDI basic facts 1990*. London: The Fédération, 1990.
- Davis, R. Kim. *Lasers in otolaryngology - head and neck surgery*. Philadelphia: Saunders, 1990.
- Kunzel, Walter. *Geriatric dentistry in eastern European countries*. Chicago: Quintessence, 1991.
- Laskin, Daniel M. *Infections of the head and neck*. Philadelphia: Saunders, 1991.
- Malkin, Jain. *Medical and dental space planning for the 1990's*. New York: Van Nostrand Reinhold, 1990.
- Neidle, A. Enid and Yagiela, John A. *Pharmacology and therapeutics for dentistry*. - 3rd ed. - St. Louis, Toronto: Mosby, 1989.
- Phillips, Ralph W. *Skinner's science of dental materials*. - 9th ed. - Philadelphia: Saunders, 1991.
- Simonsen, Richard D. *Dentistry in the 21st century: a global perspective*. Chicago: Quintessence, 1989.
- Smukler, Hyman. *Equilibration in the natural and restored dentition*. Chicago: Quintessence, 1991.
- Stock, C.J.R. *Endodontics in practice*. London: British Dental Association, 1989.
- U.S. Department of Health and Human Services. *NTP Technical Report on the toxicology and carcinogenesis studies of sodium fluoride*. [U.S.: The Department], 1990.
- U.S. Department of Health and Human Services. *Review of Fluoride, Benefits and Risks*. [U.S.: The Department], 1991.
- Waal, Isaël van der. *Burning mouth syndrome*. Copenhagen: Munksgaard, 1990.

Videos - VHS

- Bleaching teeth
- Current use of crowns in dentistry
- Dentin adhesives used effectively
- Implants - prosthodontic considerations
- Implants - surgical considerations
- Infection control made easy
- Posterior composite techniques
- Repair and salvage of fixed prosthodontic restoration
- Simple and effective sealant use
- Simplified management of medical emergencies

Audio Cassettes

- TMJ and the stomatognathic system: dysfunction and therapy



One copy of the above package of articles is available for \$5.00 to all CDA members and for \$10.00 to non-members. (G.S.T. and, Ontario residents, please include 8% sales tax.)

Daily: 1-800-267-6354 (Western Canada and area code 709)
1-800-267-6364 (Eastern Canada excluding area code 709)

Envoy: CDN.DENTAL.LIB

FAX: 613-523-7736

Les membres de l'ADC peuvent obtenir pour 5\$ et les non membres pour 10\$ une copie des articles de la bibliographie ci-dessus.

Aux heures ordinaires :
1-800-267-6354 (l'ouest du Canada et la région dont le code est 709)
1-800-267-6364 (l'est du Canada, sauf la région dont le code est 709)

Programme informatique

Envoy : CDN.DENTAL.LIB

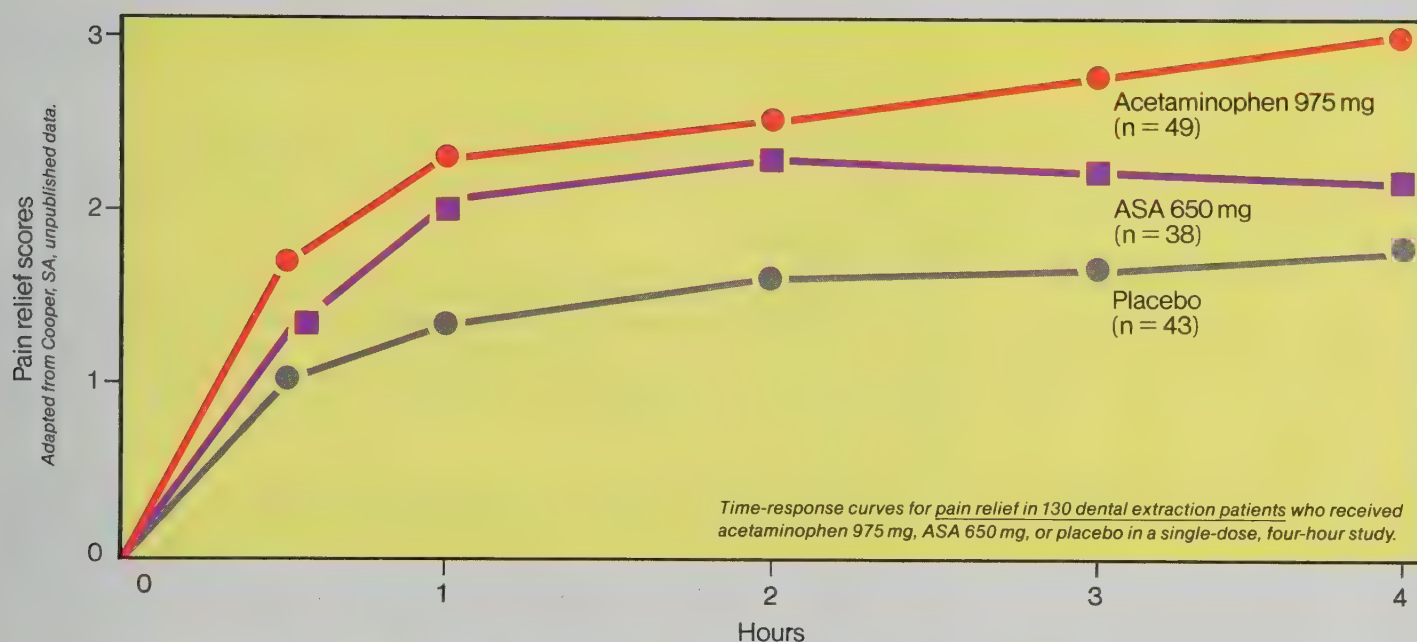
FAX : (613) 523-7736

YOU HAVE TO THINK ABOUT MUCH MORE THAN PAIN RELIEF WHEN YOU RECOMMEND AN ANALGESIC

With some of the many analgesic choices available, you need to address a lot of medical questions to make a responsible professional recommendation.

Is the patient asthmatic or sensitive to salicylates, prone to ulcers, taking potentially incompatible drugs? A "yes" to any of these questions would exclude any ASA or ASA-narcotic combination product as well as all NSAIDs. And, of course, if there is a risk of bleeding, they would also all be contraindicated because their antiplatelet activity could aggravate bleeding.

Extra-Strength **TYLENOL** acetaminophen is a logical choice. It is not contraindicated in any of these situations.



EXTRA-STRENGTH
TYLENOL ^{*}
acetaminophen
CAPLETS

A responsible professional recommendation
combining excellent safety and efficacy profiles

The DAP Advisor

The DAP Advisor offers information, ideas and advice to improve dentist/patient communication, raise awareness about good dental health, and help your practice become busier.

It's in the Cards: How Business Cards Can Help Increase Your Busyness

One of the ways to make your business card more of a keeper is to include information on what to do in case of a dental emergency on the back of the card. You could detail, for example, what patients should do when:

- A tooth is knocked out
- A denture or bridge breaks
- There is swelling
- They have a toothache

A business card may seem to be nothing more than a small rectangle of paper with a name, address and phone number printed on it. In reality, however, a business card can be a powerful communications vehicle that can have an impact out of all proportion to its size. Provided, that is, that the card conveys the right impression about your practice, and that it is circulated as widely as possible.

There are two main avenues for circulating your business card: your patients and your dental team members. The first approach is likely to be the most effective one. Statistics have shown that most people select a dentist by asking their friends, family or co-workers who they go to. If patients can pass on your business card along with their recommendation, it may give the prospective patient that much more incentive to call.

As for the second approach, while you might think that you and your team members would have plenty of opportunities to offer a business card to prospective patients — at the dry cleaners or the barber shop, perhaps — in reality it is not always that easy to hand them out. Nonetheless, your business card can be a vital element in fostering dental team pride and cohesion. This is especially true when each team member has a card with his or her name and title on it.

Here are a few hints that can help you to create effective business cards, and both you and your team to ensure that as many cards as possible are making the rounds in your community.

• Make it look good

A business card is a tangible representation of your practice. If your card looks good — if it's printed on good quality paper in a typeface that is easy to read, for example — you'll look good too. People are also more likely to keep something that looks impressive, and may be more inclined to pass it along to others.

• Make sure it includes basic information

Obviously, your business card should include your name, address and phone number. However, if your office is in a location that is hard to find or not very well known, it can be a good idea to include a map on your card as well.

• Make it distinctive

It doesn't have to be fancy, but your card should have something visually distinctive about it. A practice logo or a particularly interesting graphic will help convey what makes your practice unique. You might also want to include a motto or tag line that sums up your practice's philosophy, for example: "We Care," or, "Dedicated to Excellence." These small touches are a kind of shorthand, allowing a potential patient to know at a glance about your practice. They can also help you make a stronger first impression and may increase the likelihood that the new patient will call.

• Include something extra

Your business card is likely to have more staying power if it contains some other useful information. A business card that includes "The Five Point Prevention Plan," for instance, or what to do in case of a dental emergency, is more of a keeper than one that just has a name, address and phone number. Because it includes something extra, the card is something that patients can give to family, friends and associates to keep in their wallet. Your card can thus also become a vehicle for educating people and heightening their dental awareness.

• Encourage patients to pass out your card

If you want the maximum number of patients to hand out the maximum number of your cards, you have to make the cards easily accessible. That means displaying them in a place where they are easy to see and easy to reach. A desk-top sign can urge patients to take some cards and pass them along. Don't assume, however, that patients will see either the cards or the sign. The best way to make them aware of the cards is, quite simply, to tell them where the cards are and why. At an appropriate time the receptionist or another team member can bring the cards to the patients' attention and gently encourage them to pass the cards along.

• Encourage team members to pass out cards

It is probably a lot easier for team members to give out their business card inside the office than outside it. Nevertheless, team members should be encouraged to take a pro-active approach and distribute the cards as widely and as frequently as they can.

• Thank patients for their referrals

Patients are doing you a favor by passing along your card. When their efforts result in a referral, make sure you let them know how much you appreciate it. A handwritten note is probably the best way to express your thanks. Not only does it demonstrate how much you value their referrals, it also encourages patients to keep up the good work on your behalf.



The DAP Advisor is a service of CDA's Dental Awareness Program, an ongoing campaign dedicated to helping all Canadians keep their teeth Good For Life.

CDA CONVENTION - QUEBEC 1991

CONVENTION UPDATE

Dental Profession and Industry Teaming Up to Make it Happen!



The Canadian Dental Association's Annual Convention could not survive without the loyal support of the exhibitors and a number of special friends in the dental industry. This month we would like to acknowledge the support of some special sponsors and highlight their contributions.

The Exhibit Hall is set up to give you, the delegate, an opportunity to view, compare and shop around for all your dental needs. Our exhibitors deserve your support and we trust you will be sure to visit the Exhibit Hall and consult the numerous company representatives who will be on hand to serve you. Exhibitors provide staff to answer your questions and bring you up to date on the latest innovations in their particular field. The CDA Convention gives you, the dental professional, an excellent opportunity to meet your suppliers face-to-face, to discover what's new in the industry and what deals they have to offer. Don't miss out on this grand opportunity.

CDA Conventions would like to acknowledge, in alphabetical order, some of the very special sponsors who are helping to make the 1991 CDA Annual Convention possible:

Air Canada is once again providing the prize for our pre-registration draw. Some lucky pre-registrant will win return tickets (economy class) for two, to any Air Canada destination (excluding Bombay).

Ash Temple/Servident is once again providing the attractive pens delegates will find in their 'delegate kits'. It is also providing prizes for our Exhibit Attendance Draws and will sponsor a special "coffee and muffin" treat to follow the CFDE lecture presentation on Tuesday, August 27. Ash Temple also supports the printing of the Convention Program Book.

Aurum Ceramic/Classic Dental Laboratories is once again providing the Grand Prize for our Exhibit Attendance Draw. By visiting the Exhibit Hall you could win a Chrysler Daytona ES. It also supports the printing of the Convention Program Book.

Butler, John O. is to be recognized for its continued support of the Convention Program Book.

Caulk Canada is sponsoring one of the pre-convention, limited attendance sessions and also supports the Convention Program Book.

CDSPI is sponsoring one of the general sessions during the convention proper and is also providing the customized notepads delegates will receive in their 'delegate kits'.

Club Med is providing a trip for two to Guadeloupe.

Exan provides generous on-site support for our computerized registration system. It also provides the Business and Message Centre for convention delegates on site and is sponsoring the hands-on computer pre-convention course.

Everex Computers is providing support for the hands-on computers course being delivered during the pre-convention.

Healthco/Dépôt Dentaire is to be recognized for its generous support of the 1991 Opening Ceremony (featuring the fabulous 'Cirque du Tonnerre'). It also supports the Convention Program Book.

Hoechst Canda is to be thanked for generously providing the handsome customized convention kits being distributed to convention delegates.

Nobelpharma Inc. is again sponsoring one of the pre-convention hands-on sessions.

Siemens Electric has agreed to sponsor one of the general sessions during the convention proper.

Teledyne Water Pik is supporting the Convention Program Book.

In addition to these special contributors, CDA Conventions wishes to thank the numerous dental groups that have agreed to support the convention's scientific program, in particular, our thanks to the Association of Prosthodontists of Canada, the Canadian Association of Orthodontists, the Canadian Fund for Dental Education and Laval University's Faculty of Dentistry.

Michel Jahjah, D.D.S.
General Chairman
CDA Conventions

CDA CONVENTION - QUEBEC 1991

PRE-CONVENTION PROGRAM - LIMITED ATTENDANCE**

SIMULTANEOUS
TRANSLATION

GORDON J. CHRISTENSEN, D.D.S.,
M.S.D., Ph.D.
Provo, Utah



SATURDAY, AUGUST 24

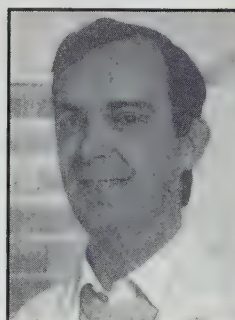
"New Aspects of Dentistry - 1991"

This program is designed to update practitioners in many of the new and useful aspects of dentistry. The following subjects are included:

- Posterior Tooth Restorations - A comparison and clinical critique of tooth colored inlays, onlays and class 2 composites with amalgam and cast gold.
- Fixed Prosthodontic Advances - Making better tooth preparations and a comparison of new cements.
- Dentin Adhesion - A candid look at current products claiming bond to dentin and products that bond amalgam to tooth structure.
- Bases and Liners - A comparison of the many new types of bases available, including traditional glass ionomer, resin and light cured glass ionomer.
- Efficient, practical infection control.
- The amalgam controversy.
- Many new materials, devices and techniques evaluated recently by Clinical Research Associates.

About the clinician:

Dr. Christensen is founder and Senior Consultant of Clinical Research Associates (CRA), which conducts research on dental materials, techniques, devices and new concepts in dentistry. Dr. Christensen is founder and Director of Practical Clinical Courses, established in 1981 as a Career Development Program for dentistry. Currently he is in private practice in Utah, and he participates on the post-graduate faculties of many dental schools. He is an Adjunct Professor at Brigham Young University and a Clinical Professor at the University of Utah.



TORSTEN JEMT, D.D.S., PH.D.
Gothenburg, Sweden

SATURDAY, AUGUST 24 & SUNDAY, AUGUST 25

HANDS-ON COURSE

"Basic Clinical Prosthetic Training Course on Osseointegrated Implants"

This course is designed to give prosthodontists and general practitioners knowledge about the prosthetic procedures of the Branemark System.

Topics to be addressed will include:

- * Introduction and review of clinical and physiological problems associated with edentulism and partial edentulism.
- * Presentation of conventional treatment concepts including comments on other implant systems.
- * Review of the scientific background of the Branemark system including biological considerations, biomechanical aspects and technical engineering aspects.
- * Brief overview of surgical procedures and presentation of surgical aspects of significance for prosthetic rehabilitation.
- * Prosthetic treatment planning, patient selection, indications and contraindications.
- * A detailed presentation of prosthetic, clinical and technical aspects covering various techniques and the use of different materials.
- * Hands-on training that includes presentation of components, instruments and the different steps involved in the clinical treatment sequence.
- * Presentation of patients in various stages of treatment including completed patients.
- * Discussion of possible complications and how to handle them.
- * Discussion of patient control and maintenance program including radiographical technique and computer possibilities in long term patient follow-up.

About the clinician:

Dr. Jemt obtained his D.D.S. in 1975 and specialized in prosthodontics in 1982. His Ph.D. thesis was defended at the University of Gothenburg in 1984. In 1988 he was made Associate Professor in Prosthodontics. Since 1986 he has been Associate Head of the Branemark Clinic. Dr. Jemt has presented more than 100 lectures to professional audiences and is the author of over 30 scientific publications. He is currently involved in research on single tooth replacements.

CDA CONVENTION - QUEBEC 1991

PRE-CONVENTION PROGRAM - LIMITED ATTENDANCE**

IMTIAZ MANJI, B.Sc.
Vancouver, B.C.



AND



TOM SNYDER, D.M.D., M.B.A.
Cedar Knolls, N.J.

SATURDAY, AUGUST 24

HANDS-ON COURSE

"The First Step to High Tech - Demystifying Computers"

Each participant will begin the seminar with an unassembled computer in front of them. Working from the ground up, Mr. Manji and Dr. Snyder will explain computer technology in straight-forward, non-technical terms and guide the participant through assembly of their own computer.

Once the computers have been assembled, they will be powered up and Mr. Manji and Dr. Snyder will continue their discussion about popular computer programs and dental practice management software.

Topics will include: cost considerations in office computerization, common software features, comparing software applications, assessing a computer vendor's capabilities, conducting reference checks, hardware and software maintenance, data conversion and implementation, and an update on new applications in patient treatment.

SUNDAY, AUGUST 25

"Managing for Financial Success"

This seminar will show you the steps you need to take to effectively manage your practice's growth and achieve personal and financial independence. Unlocking the wealth of your practice and translating it into growth and success can only be accomplished through strategic financial management and practice planning.

As a participant you will learn the critical indicators of a healthy practice, how to collect and analyze data to measure the health of your practice, and how to use planning tools like spreadsheets and financial models to simplify decision-making. Analyzing your practice on a monthly basis in this manner will reveal hidden opportunities for success in retirement planning, practice profitability, practice value, staff retention, patient flow and productivity. In addition, you will learn methods to involve your team in the success of the practice through profit-sharing, bonus structures and fringe benefits.

About the clinicians:

Imtiaz Manji is President of ExperDent Consultants Inc. and founder of Exan Technologies Inc. Mr. Manji travels extensively to deliver his unique perspective on high-tech, high-touch practice management to Canadian dentists. He has a quarterly column "Practicing for Success" in which he reveals how his down-to-earth approach to technology has assisted many Canadian dentists to attain tremendous increases in productivity and financial stability.

Dr. Thomas Snyder is President of the Healthcare Financial Network Ltd., an affiliated company of The America Group Ltd., of Radnor, Pennsylvania. He is a graduate of the University of Pennsylvania's School of Dental Medicine as well as a graduate of the Wharton School of Business. Dr. Snyder was formerly associated with Sarantos & Company, Inc. where he served as its Director of Professional Services.

Quebec 1991

Summary of Lectures and Events

Dentists ▪ Hygienists ▪ Assistants ▪ Administrative Staff ▪ Spouses

❖ Simultaneous Translation
❖ Traduction simultanée

Hilton
Porte du Palais

Hilton
Porte Kent

Hilton
Porte St-Louis

Hilton
Beauport

Hilton
Beaumont-Belair

Saturday / Samedi August 24 août 8:30 - 12:00 13:30 - 16:00	DÉJEUNER / LUNCH 12:30 - 13:30	Gordon Christensen ❖ Restorative Dentistry		Imtiaz Manji Tom Snyder Computers (Hands-on)	Torsten Jemt Implants (Theory)
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Sunday / Dimanche August 25 août 8:30 - 12:00 13:30 - 16:00	DÉJEUNER / LUNCH 12:30 - 13:30	Imtiaz Manji Tom Snyder Practice Management	Torsten Jemt Implants (Hands-on)		
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Monday / Lundi August 26 août 8:30 - 11:00	Dennis Smith ❖ Biomaterials and Biocompatibility	Léo Pelletier La classification des maladies parodontales	GRIEVE MEMORIAL LECTURE Edwin Yen Orthodontic Advances - Biological Solutions		John Young Dental Office Lighting and Design
Monday / Lundi August 26 août 13:30 - 16:00	Robert Samp ❖ Stress: Living In, With and In Spite of It.	Hubert Gaucher L'avenir est aujourd'hui - le CAD/CAM en médecine dentaire	Philip Molloy Endodontic First Aid		John Young Ergonomics and Asepsis

Tuesday / Mardi August 27 août AM 10:00 - 12:00	Jeffrey Simpson Canada at the Crossroads 8:30 - 9:30 Sebastian Ciano ❖ Periochemotherapeutics 10:00 - 12:00	Gilles Gauthier Les prothèses partielles amovibles	Philip Molloy Exploring Periapical Surgical Approaches	Université Laval MISE À JOUR EN RECHERCHE DENTAIRE	Mark Sarner The Canadian Dental Consumer in the 90's
Tuesday / Mardi August 27 août 14:00 - 16:30	Sol Silverman ❖ Update on AIDS, HIV infections and Dentistry	Salam Sakkal Endodontie	Charles Blair Controlling Practice Overhead		Peter Guevera Light Activated Materials Systems

Wednesday / Mercredi August 28 août 8:30 - 11:00		Sol Silverman Oral Cancer and Premalignant Lesions	Charles Blair Dental Practice Transitions		
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Québec 1991

Sommaire des conférences et activités

Dentistes • Hygiénistes • Assistant(e)s • Personnel Administratif • Conjoint(e)s

EXHIBITS / EXPOSITIONS

9:00 - 18:00

Monday, August 26 • Lundi 26 août
Tuesday, August 27 • Mardi 27 août

*Quebec City Convention Centre
Centre des Congrès de Québec*

OPENING CEREMONY • CÉRÉMONIE D'OUVERTURE

Sunday, August 25 • Dimanche 25 août
Grand Théâtre, Québec

PRESIDENT'S GALA — "CHARME ET CHAPEAU" — GALA DU PRÉSIDENT

Monday, August 26 • Lundi 26 août
Quebec Hilton Ballroom • Salle de bal Québec Hilton

MEET & GREET "TROPICAL NIGHT" • SOIRÉE DES RETROUVAILLES "SOIRÉE TROPICALE"

Tuesday, August 27 • Mardi 27 août
Quebec Hilton Ballroom • Salle de bal Québec Hilton

Hilton
Portneuf-Ste-Foy

Hilton
Montmorency-Courville

Hôtel des Gouverneurs
Duquesne

Hôtel des Gouverneurs
Jonquière

Hôtel des Gouverneurs
Lauzon

Monday / Lundi
August 26 août

Kenneth Shay
Guidelines for Restoring
the Aged Dentition

Domenic Morielli
Le généraliste
et les dents incluses

Anita Jupp
Practice
Management

Edward Kisling
Credit and
Collection

8:30 - 11:00

Monday / Lundi
August 26 août

Kenneth Shay
Dental Management
of the
Frail Older Patient

Gérard Bouger
Le marketing
au service du
cabinet dentaire

**Olga Skica
Lorre Wiseman**
Periodontics
into the 90's

Barbara Steinberg
Medical Considerations
for the
Female Patient

13:30 - 16:00

Tuesday / Mardi
August 27 août

Barbara Steinberg
Team Approach
to Treating the
Dental Patient
with Medical Problems

Joanne LaMantia
Computers in the
Dental Practice

Dennis Smith
Update on Bondings
and Cements

Robert Samp
Survival Strategies
for Today's People

10:00 - 12:00

Tuesday / Mardi
August 27 août

Sebastian Ciano
Dento-therapeutics

Sylvie Morin
Dentisterie
Opératoire

**TABLE CLINICS /
ENTRETIENS CLINIQUES**

Marilyn Ciano
Leadership &
Volunteerism

14:00 - 16:00

Wednesday / Mercredi
August 28 août

**Hélène Lemay
Anne Charbonneau**
Anesthésie
locale et
électrique

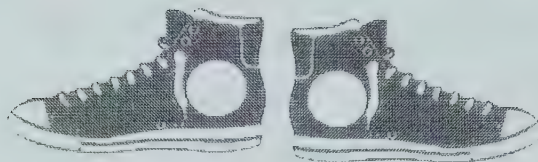
Peter Guevera
Complete and
Partial Dentures

8:30 - 11:00

CDA CONVENTION - QUEBEC 1991

ANNUAL FUN RUN

An open challenge:
Which province
will have the most participants?



Monday, August 26th

Run begins at 7 AM

Participants to meet at the Hilton parking lot (6:30 am) and walk to the site - the historic Plains of Abraham.

SUPPORT YOUR EXHIBITORS ! VISIT THE EXHIBIT HALL

The technical exhibits will be open throughout the convention - even during lunch hour! The exhibit booths are staffed by knowledgeable personnel who are ready to answer your questions and to acquaint you with their products and technology. Don't miss the opportunity to see the latest innovations in dental technology.

HOURS:	MONDAY, AUGUST 26	9 AM TO 6 PM
	TUESDAY, AUGUST 27	9 AM TO 6 PM

"A one-stop shop for all your dental needs."

CDA CONVENTION - QUEBEC 1991

TUESDAY, AUGUST 27

8:30 - 9:30 AM

JEFFREY SIMPSON

"CANADA AT THE CROSSROADS"



The 1991 edition of the **Murray McDonald Memorial Lecture** sponsored by the Canadian Fund for Dental Education (CFDE) will feature an address by Mr. Jeffrey Simpson, National Affairs Columnist for *The Globe and Mail* and contributor to *Le Devoir*.

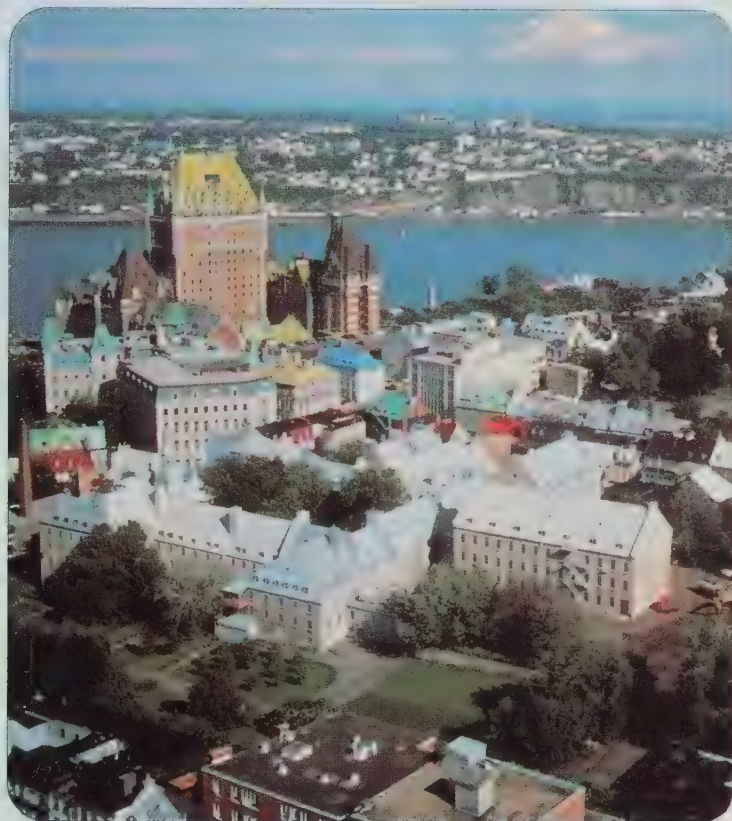
Winner of a National Newspaper and Magazine Award for column writing, *The Globe and Mail's* National Columnist has a keen ability to analyse and speak passionately about the state of the nation in these troubled times.

Regular weekly appearances on CBC's *Sunday Report* complement Jeffrey's extensive work in important magazines and his long list of books, which include *Spoils of Power: Political Patronage in Canada*.

Whither Canada? Jeffrey Simpson knows.

**A great opportunity...
to meet the dental industry staff
and
your colleagues from across
the country!**

Tuesday, August 27th will start with the CFDE lecture at 8:30 am. Everyone is invited. At 9:00 am, **Ash Temple/Servident** is extending an invitation to all delegates to join them for coffee and muffins in the Exhibit Hall.



CDA CONVENTION - QUEBEC 1991

CDA Conventions and
Healthco/Dépôt Dentaire (Canada) Limitée presents...

The 1991 Opening Ceremony

featuring
'Cirque du Tonnerre'

Sunday, August 25th
5 pm - 7 pm
at Quebec's Grand Théâtre



Program also includes:

- * Welcoming Address
- * L'Ensemble Anonymus Inc.
presents 'El Siglo de Oro'
- * Le Cirque du Tonnerre
- * and more.

Space is limited, reserve early when you pre-register.

CDA CONVENTION - QUEBEC 1991

SOCIAL PROGRAM

"SOIRÉE CHARME ET CHAPEAU"

Monday, August 26

Cocktails 7 pm - 8 pm Dinner/Dance 8 pm - 1 am

*The cherished **President's Gala Dinner and Dance** (black-tie optional) will feature the music of **Roland Martel** and his orchestra and **L'Ensemble Vermeer**.*



Request your tickets when completing your pre-registration form.

*** Prizes to be awarded to those wearing the most 'unique' hats (chapeaux) this evening.**

"SOIRÉE TROPICALE"

Tuesday, August 27

8 pm - 1 am

Sail away to a tropical "Island of Paradise" at the 1991 CDA Convention's 'Meet and Greet' event.

*Featuring **Marco Nolasco and the "Son del Pacifico"** specializing in the dance rhythms of the tropics, Latin America and the Caribbean - an excellent opportunity to practise the 'lambada', the 'cumbia', the 'samba' and the 'merengue'!*

An evening of fun and frolic for every member of the dental team!
Request your free tickets when completing your pre-registration form.

During the "Soirée Tropicale" the winner of the Club Med package for two to Guadeloupe or Caravelle will be announced. Special thanks to *Club Med* for providing the prize!

CDA CONVENTION / CONGRÈS DE L'ADC - QUÉBEC 1991

EXHIBITORS LIST - LISTE DES EXPOSANTS

3M Canada Inc.....515

A

A-Dec Inc.....914, 915
A.B.C., Les Instruments
Medicaux Inc.....114
ABEL Computers Ltd.....111
Abeer Inc.....1305
Amadent Corp.....1501
(American Dental & Dental
Corp.)
American Dental Association.....612
American Express Canada.....1204
Anchor Implants Systems Inc.....310
Ash Temple Ltd.....506, 508, 510, 512,
514, 607, 609, 611, 613, 615
Astra Pharma Inc.....604
Aurum Ceramic/Classic Dental
Labs Ltd.....400, 402,
501, 503
Aurum Crest Dental Labs. Ltd.....505

B

Bausch & Lomb Canada Inc.....713
Belmont Takara Company
Canada Ltd.....1505, 1506
Block Drug Company Ltd.....110
Brasseler Canada Inc.....905
Buffalo/Bolton Dental Mfg. Inc.....812
Burroughs Wellcome Inc.....214
Business & Message
Center.....500, 502, 601, 603
Busse Dental Supplies.....715
Butler, John O., Company.....909

C

C & B Dental Laboratories Inc.....106
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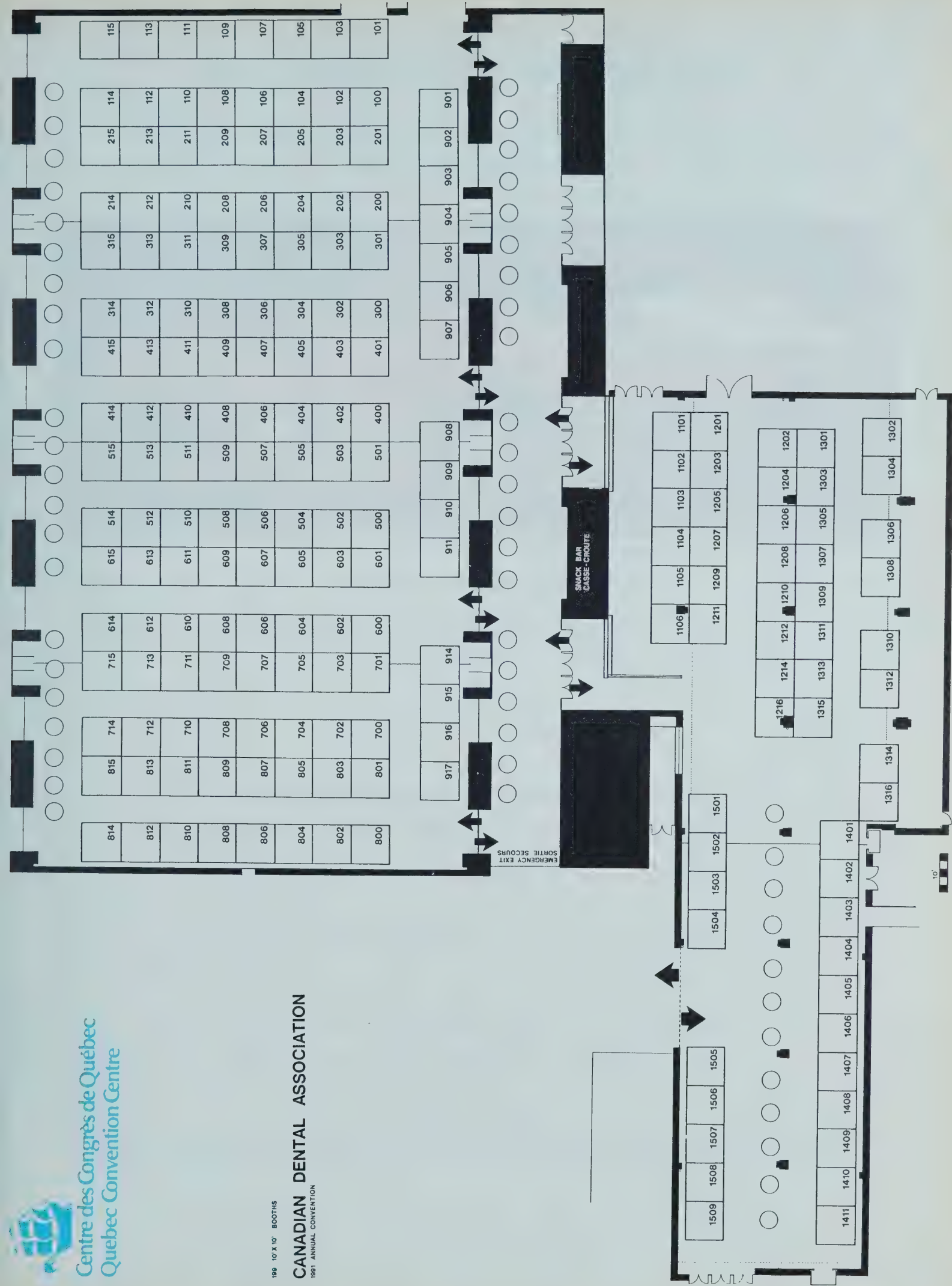
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199 10' X 10' BOOTHS
CANADIAN DENTAL ASSOCIATION
1997 ANNUAL CONVENTION



CDA CONVENTION - QUEBEC 1991

Visit the 1991 Exhibit Hall and win ...in more ways than one

More than 180 booths representing dental suppliers from across the continent with staff who are ready to serve YOU and answer your questions.



Prize to be awarded may not be exactly as shown.

To be eligible to win a **Chrysler Daytona ES** visit the Exhibit Hall and drop off your personalized, non-transferable ticket. Tickets will be forwarded to all pre-registrants with their name badge and convention tickets. Thanks to **AURUM CERAMIC/CLASSIC DENTAL LABORATORIES** for supplying the grand prize for this year's Exhibit Attendance Draw.

You are invited to share some muffins and coffee
on Tuesday, August 27th in the Exhibit Hall at 9 a.m.
The scientific lectures will begin at 10 a.m. on this day.

Compliments of ASH TEMPLE/SERVIDENT

Draws for valuable prizes will also be held.
To be eligible, visit the 1991 Exhibit Hall.

CDA CONVENTION - QUEBEC 1991

SPOUSES' PROGRAM

Monday, August 26

Walking Tour of Old Quebec
(rain or shine - be prepared!)
Principles of Wine-tasting
Lunch in Old Quebec

Tuesday, August 27

Boat Cruise on the St. Lawrence
Principles of Wine-tasting
Luncheon

Plus three lecture presentations:

Monday, August 26
(1:30 - 4:00)

Robert Samp, MD

Stress: Living In, With and In Spite of It (simultaneous translation)

Tuesday, August 27
(10:00 - 12:00)

Robert Samp, MD

Survival Strategies for Today's People

Tuesday, August 27
(2:00 - 4:30)

Marilyn Ciano, BA, MA

Leadership & Volunteerism: What Makes It Work?

CHILDREN'S PROGRAM

**A two-day program for children ages 5 and up,
co-ordinated by Quebec's YM-YWCA**

Monday: * A full-day trip to the zoo (weather-permitting)
(in the event of rain the children will enjoy a 'special' presentation in
doors and a trip to the "Voûtes du Palais" (vaults) in the afternoon);

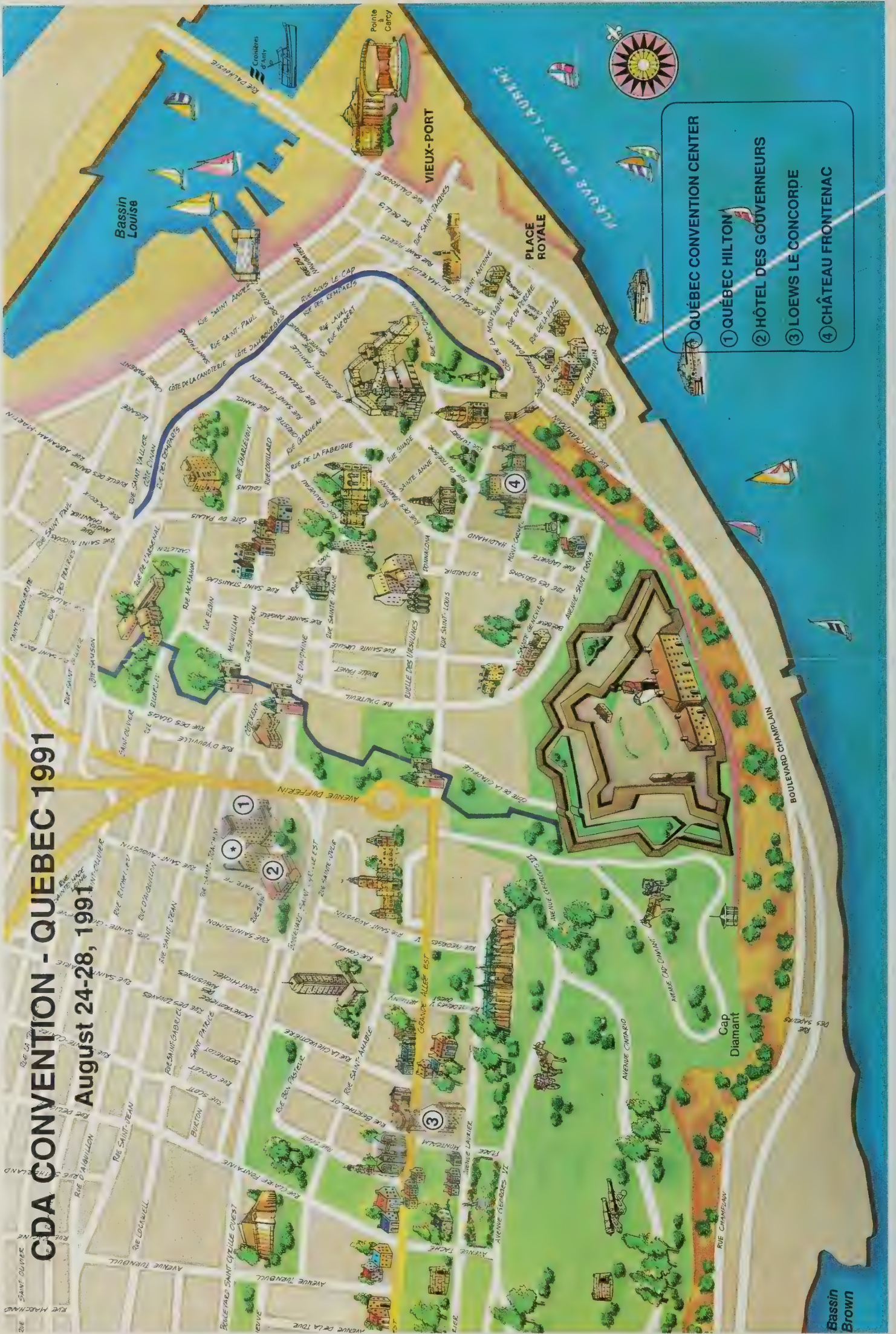
Tuesday : * In the morning, a trip to the Museum of Civilization;
* In the afternoon, games and activities at the "Y-Quebec" - remember to
bring your sneakers and swimsuits!

*Register your children today - bilingual supervision, daily snacks
and lunch included!*



CDA CONVENTION - QUEBEC 1991

August 24-28, 1991



QUÉBEC CONVENTION CENTER

- ① QUÉBEC HILTON
- ② HÔTEL DES GOUVERNEURS
- ③ LOEWS LE CONCORDE
- ④ CHÂTEAU FRONTENAC

1991 CANADIAN DENTAL ASSOCIATION ANNUAL CONVENTION

August 24 - 28, 1991 ■ Quebec

Hotel Reservation Form

Please check appropriate category:

☐ Dentist ☐ Hygienist ☐ Assistant ☐ Exhibitor ☐ Office Personnel ☐ Other (please specify) _____

Name: _____

Address: _____

City: _____ Province: _____ Postal Code: _____

Telephone: (____) (____)
(Residence) (Office)

Type of Room:

☐ Single ☐ Double ☐ Twin ☐ Other (please specify) _____

Indicate first three hotel choices* (by numbering the boxes):

- ☐ Quebec Hilton (CDA Headquarters) \$ 130.00 single / double
☐ Hotel des Gouverneurs (CDA Headquarters) \$ 115.00 single / double
☐ Loews le Concorde \$ 120.00 single / double
☐ Château Frontenac \$ 140.00 single / double

* Prices do not include GST

Arrival Date: _____

Departure Date: _____

Arrival Time: _____

In order to reserve a room, a guarantee for the first night is essential. The guarantee will apply to the first night ONLY.
To cancel your reservation advise the CDA at least three (3) days prior to your arrival.

☐ MasterCard ☐ American Express ☐ VISA

Card Number: _____

Expiry Date: _____

Signature: _____

Send Reservation Form to:

CDA Conventions
Canadian Dental Association
1815 Alta Vista Drive
Ottawa, Ontario
K1G 3Y6

DEADLINE for Reservations: July 10, 1991

ONE FORM PER PERSON
Duplicate for multiple
registrations.

CANADIAN DENTAL ASSOCIATION CONVENTION

Quebec • August 24 - 28, 1991

PRE-REGISTRATION FORM • Please PRINT

With the computerized registration system, it is *essential* that each registrant fill out a separate form. To ensure your requests are accommodated - *register early*. Advance registrations will be accepted until **July 10, 1991** after which they will be returned to the sender. Each on-site registration will be subject to a \$27.00 administrative fee (GST included).

SURNAME: _____ FIRST NAME: _____ SEX: M F

ADDRESS: _____ (Street) _____ (City) _____ (Province)

TELEPHONE: () () () () () () (Office) (Residence)

(Postal Code) _____ License Number: _____

PRE-CONVENTION • AUGUST 24, 25 • Limited Attendance

SATURDAY, AUGUST 24

** Gordon Christensen, D.D.S., M.S., Ph.D. - RESTORATIVE - Lecture
Dentist \$ 160.00
Staff \$ 70.00
Imtiaz Manji, B.Sc. & Tom Snyder, D.M.D., M.B.A. - COMPUTERS - Hands-on Program
Dentist (limited attendance) \$ 250.00
Staff (limited attendance) \$ 250.00

SUNDAY, AUGUST 25

Imtiaz Manji, B.Sc. & Tom Snyder, D.M.D., M.B.A. - PRACTICE MANAGEMENT - Lecture
Dentist \$ 160.00
Staff \$ 70.00

Torsten Jemt, D.D.S., Ph.D. - IMPLANTS - Hands-on Program

• TWO-DAY COURSE: SATURDAY AND SUNDAY •

Dentist (limited attendance) \$ 350.00

* GST is not charged on Pre-convention courses. ** Simultaneous translation.

CONVENTION • AUGUST 26, 27, 28

☐ DENTIST

Member, CDA (7% GST included) \$ Nil
Non-member, Others (7% GST included) \$ 155.00

Includes: Scientific sessions and exhibits

If you would like to use this opportunity to become a CDA member, call CDA Conventions at (613) 523-1770.

☐ DENTAL HYGIENIST

CDHA Member (7% GST included) \$ 70.00
Non-member (7% GST included) \$ 102.00

Includes: Scientific sessions and exhibits

☐ DENTAL ASSISTANT

CDAA Member (7% GST included) \$ 70.00
Non-member (7% GST included) \$ 102.00

Includes: Scientific sessions and exhibits

☐ **TECHNICIAN** (7% GST included) \$ 70.00

Includes: Scientific sessions and exhibits

☐ **ADMINISTRATIVE PERSONNEL** (7% GST included) \$ 70.00

Includes: Scientific sessions and exhibits

☐ **STUDENT** ☐ Dentist ☐ Hygienist ☐ Assistant \$ Nil

Includes: Scientific sessions and exhibits

☐ **ACCOMPANYING PERSON/SPOUSE** ... (7% GST included) \$ 102.00

Includes: Scientific sessions, exhibits and Spouses' Program.

☐ **CHILD** (7% GST included) \$ 65.00

Open to children 5 years and older. Child's age: _____

Includes: Access to convention and Children's Program.

GST Registration Number: R016845209

☐ SOCIAL EVENTS

Sunday - Opening Ceremony - Subject to space availability

Will attend ☐ Yes ☐ No \$ Nil

Monday - President's Gala - "Soirée Charme et Chapeau"

(per person) (7% GST included) \$ 60.00

Tuesday - Meet & Greet - Tropical Night

Will attend ☐ Yes ☐ No \$ Nil

☐ FUN RUN

Monday A.M. (7% GST included) \$ 16.00

TOTAL \$ _____

The above registration fees are paid by _____

☐ I wish to pay the above total by credit card: ☐ MasterCard ☐ VISA ☐ AmEx

Card#: _____ Expiry date: _____

Signature of Cardholder: _____

☐ I enclose a cheque payable to the Canadian Dental Association.

Post-dated cheques will *not* be accepted.

Mail registration form with payment to:

1991 CDA Convention
1815 Alta Vista Drive
Ottawa, Ontario
K1G 3Y6

Dentists, Assistants, Hygienists, Office Personnel & Technicians registering by July 10, 1991 will be eligible to win two tickets anywhere Air Canada flies in Europe and North America!

Canadian Dental Association 1991 Annual Convention
AUGUST 24 - 28
QUEBEC, QUEBEC

**We Look Forward to Registering YOU, your staff, your colleagues,
your family, your friends... !**

Pre-registering for the Convention

- Register early. If you register on, or before, **July 10, 1991**, you will be eligible to win two tickets - anywhere Air Canada flies (except Bombay).
- *Limited attendance pre-convention courses* are filled on a first come, first served basis.
- Each individual registering for the convention must complete a separate form.
- Changes and additions can be made, in future, by calling CDA Conventions at 1-800-267-6364 (East) or 1-800-267-6354 (West and area code 709).

Reserving a Hotel Room

- If you reserve before the deadline you will be eligible to win one of two 'weekend for two' packages courtesy of the Quebec Hilton and the Hôtel des Gouverneurs (Hauteville)!
- CDA Conventions is handling the hotel reservations in-house. You will not be able to reserve directly with the convention hotels.
- To reserve, complete the 'Hotel Reservation Form' enclosed and forward (along with your 'Pre-registration Form') to CDA Conventions.
- Any changes to reservations must be made through CDA Conventions.
- Convention lectures will be held in the **Quebec Hilton** and the **Hôtel des Gouverneurs** - two convention hotels that are conveniently linked to the Quebec Convention Centre - site of the Exhibit Hall and the Convention Registration Area. The other two convention hotels - **Loews le Concorde** and the **Château Frontenac** are only a 15-minute walk away!

Making your Airline Reservations



Air Canada has been appointed the sole official carrier for the Canadian Dental Association's 1991 Annual Convention in Quebec. Special arrangements have been made with Air Canada to offer convention participants discounts on air fares. To take advantage of this service, you must call Air Canada's Convention Central when booking your tickets (your travel agent can call on your behalf). Dial 1-800-361-7585. The Convention Central hotlines are open **weekdays, 8:30 am to 8:00 pm EST/EDT**. Identify yourself and the CDA Convention (Event # CV 910840). Air Canada's convention experts will do the rest. The lowest fare available will be confirmed to you, subject to availability and advance purchase conditions.

CDSPI Reports

How much disability insurance do you really need?

If you became physically unable to practise dentistry, would you have enough disability insurance coverage to pay all the bills related to your personal life style and maintain your ongoing office expenses?

Two Plans, two objectives

The Canadian Dentists' Insurance Program (CDIP) provides two separate plans, with two separate objectives, which work together to help you enjoy a financially worry-free recovery.

Long-Term Disability Insurance

CDIP's long-term disability insurance (LTD) provides a source of income that allows you to maintain your pre-disability standard of living and meet continuing personal expenses related to shelter, food, clothing, car expenses and more. CDIP LTD allows you to insure up to 100 per cent of your pre-disability net after-tax income to the overall plan maximum of \$6,000 per month. LTD payments are nontaxable as long as you personally pay the premiums.

HOW MUCH DO YOU NEED?

Your present *monthly* net after-tax dental income \$ A

Your present LTD coverage: CDIP \$
(refer to your last CDIP invoice)

OTHER \$

TOTAL \$ B

Your income shortfall, if any, can be determined by subtracting B from A
AMOUNT OF ADDITIONAL MONTHLY LTD INSURANCE YOU NEED

NOTE: If (B) is greater than (A) at the time of disability, your benefit from the CDIP may be reduced.

What waiting period should you choose?

The CDIP LTD plan offers three different waiting periods. Every dentist's pattern of income and spending is different. That's why the amount of coverage and the waiting period you choose should be tailored to your own situation. As you establish your practice, cash flow is critical and a

short waiting period such as first-day accident, eighth-day sickness is desirable for at least some of your coverage. As your income goes up, 30- and 90-day waiting periods can be used to increase the total coverage while lowering premiums. In this way, you can use your own resources to help cover *short-term* health problems, while using longer waiting periods to utilize your insurance to cover *long-term* health problems.

Office Overhead Expense Insurance

CDIP's office overhead expense insurance (OOE) is designed to pay the continuing expenses of your office during a period of personal disability. These include important items such as rent, employee salaries, lease payments, utilities, interest on loans made for the purchase of office equipment, etc., to the overall plan maximum of \$15,000 per month.

HOW MUCH DO YOU NEED?

First, determine your variable monthly office overhead expenses:

(variable expenses are those that do change and over which you have control)

	MONTHLY EXPENSES
Employee salaries	\$
Other	\$
Other	\$
Other	\$
Other	\$
Other	\$
Other	\$

1. Total Variable Office Expenses \$

Next, determine your monthly fixed office expenses: (fixed expenses are those which do not significantly change over time)

Rent	\$
Utilities	\$
Interest payments on loans	\$
Membership fees	\$
Lease payments	\$
Business Tax	\$
Other	\$
Other	\$

CDA Retirement Savings Plan

Unit values: (Funds are valued weekly)

	Unit values as at	
Fund	May 31, 1991	April 30, 1991
Bond & Mortgage Fund	83.13476	82.54161
Common Stock Fund	17.15895	17.00718
Money Market Fund	56.17419	55.69733
Balanced Fund	32.60375	32.21389

	*Interest rates as at	
G.I.C. Fund	May 31, 1991	April 30, 1991
Term		
1 yr	8.90%	9.15%
2 yr	9.35%	9.40%
3 yr	9.35%	9.50%
4 yr	9.40%	9.50%
5 yr	9.70%	9.55%

(*rates subject to change without notice.)

Total Assets (Market value) of the Plan as of:

	May 31, 1991	April 30, 1991
	\$141,287,338.50	\$139,976,099.63

For further information:

Write:



CDSPI

Retirement Services Dept.
Suite 600
2 Lansing Square
Willowdale, Ontario
M2J 4Z3

or phone, toll-free:

Western and Atlantic Canada and Ontario Area Code 807 only 1-800-268-5418
Quebec and Ontario, (except Area Code 807) 1-800-268-3411
Metro Toronto Area 497-7117
fax number: 1-416-497-9257

2. Total Fixed Office Expenses \$

Total variable and total fixed monthly office overhead expenses (1) + (2) \$ A

Present monthly OOE coverage

CDIP	\$	Payment Plan Option #1
CDIP	\$	Payment Plan Option #2
Other	\$	
Total	\$ B	

Your office overhead expense benefit shortfall, if any, can be determined by subtracting B from A

AMOUNT OF ADDITIONAL MONTHLY OOE INSURANCE YOU NEED \$

Remember, your CDIP Office Overhead Expense maximum amount is \$15,000 per month.

Rates lower than many private plans

The premiums for CDIP's long-term disability and office overhead expense insurance are very competitive with many private plans due to the pooled buying power of CDIP, with the added benefit that CDIP

is designed by and for dentists. The small percentage of your earnings invested in these plans will be well justified by the peace of mind such coverage brings.

Free planning guide available from CDSPI

Ask for more information about CDIP disability plans from Canadian Dental Service Plans Inc. (CDSPI). We will send you an easy to complete work sheet to help you determine the amount of coverage you need.

By completing the long-term disability section of the planning guide, you will be able to determine the right answer to the "How much do you need?" question, establish what waiting period you should choose, whether you should add the cost of living adjustment, and develop a coverage strategy that is right for you.

In the case of office overhead expense insurance, you will get the right answer to the "How much do you need?" question by determining your variable and fixed office expenses, comparing these to your present monthly OOE coverage, selecting from two payment plan options, and again developing the coverage strategy that is right for you.

To complete the work sheet, you will need the latest premium rate sheet from your 1991 CDIP information kit, a copy of your last CDIP invoice, which details your current coverage, and a pocket calculator.

Don't wait until you have a health problem to determine if you have enough LTD insurance to maintain your personal life style, or sufficient OOE insurance to meet your office expenses so that the future of your practice will not be put in jeopardy.

Should you require any assistance in filling out the work sheet, please call CDSPI and ask to speak to a personal service representative. Δ

CDSPI

... owned and operated by the dentists of Canada through the CDA and Provincial Associations
2 Lansing Square

Suite 600

Willowdale, Ontario, M2J 4Z3

Telephone:

Western and Atlantic Canada and Ontario Area Code 807

1-800-268-5418

Quebec and Ontario (except Area Code 807) 1-800-268-3411

DIRECTOR, DENTAL HEALTH SERVICES

This senior management position is responsible for managing a staff of 32 and for the planning, organization and delivery of dental health services for the Edmonton Board of Health. The incumbent will participate in policy planning with the management team, determine immediate and long range plans for the Board's dental health programs, and provide leadership in clinical services.

QUALIFICATIONS: Graduation in dentistry and a post graduate fellowship, degree or diploma in Dental Public Health. The successful candidate will likely have considerable experience in planning and managing public health programs as well as delivering clinical services.

Applications should be submitted in writing to Dr. James Howell, Medical Officer of Health, Edmonton Board of Health, #500, 10216 - 124 Street, Edmonton, Alberta, T5N 4A3 (phone 403-482-1965). Applications will be accepted until a suitable candidate is found. This position will commence effective 1991 09 01.

Please quote posting number HD-21-91.



Promoting, Protecting and Serving the Public's Health in Edmonton since 1892.

Test drive the new high p



It has better handling, super equipped with a

The new XRV™ is loaded with features that will bring you to higher levels of performance.

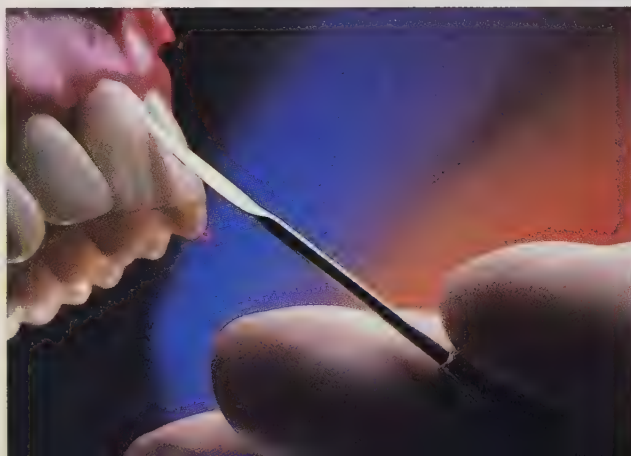
Better handling for starters. Because it's been updated with a new process, it has less tackiness to resist sticking to placement and sculpting instruments. So you can get more precise sculpting without slumping to produce realistic anatomical form.

But that's only the beginning.

When it comes to beautiful, high lustre surfaces, the new XRV™ really shines.

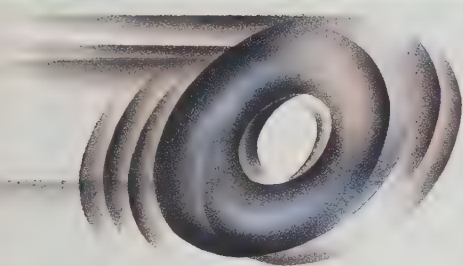
The widest range of true Vita® shades.

Maximum realism. More life-like colour. These are only some of the features you get with our new Vita® Colour System of 16 enamel shades, 7 dentin shades and 2 incisal shades.



The new XRV™ is also ideal for porcelain repair because shades accurately match most lab fabrications. Our quality control system is second to none. Batches that don't meet our standards don't get out the door. Period. So you're assured of predictability from batch to batch.

formance XRV Herculite.[®]



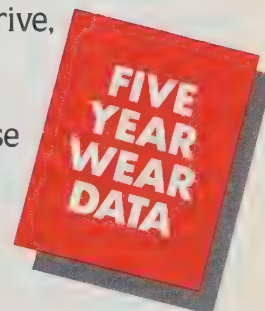
for Vita[®] shades and comes
with a five year warranty.¹

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Although we're using a new process to make the XRV[™], the old record still holds. In terms of strength and durability, our micro-hybrid composite still retains the same five year in-vivo wear data that's earned the ongoing respect of dental professionals everywhere.



To see about a test drive, contact your Kerr representative at 1-800-263-5377. Because when it comes to performance, we now leave the others behind.



XRV Herculite[®]
The New High Performance Standard.

¹Leinfelder K, Wisniewski JF, Isenberg BP. Clinical evaluation of Herculite (Injectable/Condensable) – a light-cured posterior composite resin. Five year wear data. Internal report on file. Kerr Manufacturing Company. XRV Herculite has a two year shelf life. Vita is a registered trademark of the Vita Zahnfabrik, Company, Germany.

KERR

6845 Rexwood Road, Unit #2, Mississauga, Ontario L4V 1S5

Dental Students' Forum

Taking the Research Road

Terry A. Wong, B.Sc., B.A., M.A., B.Sc. (Dent), D.M.D.

When I was 6, I was impressed by how much my teachers knew. Later, when I started to read, I discovered that all their knowledge, and more, could be gleaned from books. But no matter how many books I poured through, as I grew older I found that there were still many questions that remained unanswered.

In my first year of dental school, this basic truth struck home again, hard. The huge amount of new information that I was required to learn and retain amazed me. It was, to say the least, a tough year.

Somehow I survived. Then, like most students, I began the ritual of finding a summer job. And, like them, I dreamed of earning \$10,000 to \$12,000 for my labor, so that I could cover my school and living expenses for the next year. Unfortunately, no "dream" jobs were available, and I ended up back at square one, looking at the possibility of doing research work at the dental school.

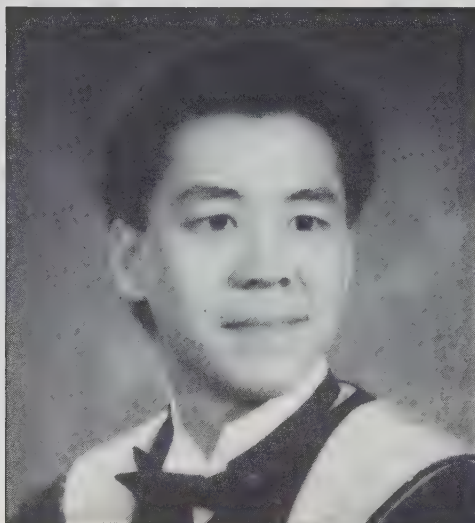
I had done some research before entering dentistry, so I had an idea of what it would be like — you know, a well-equipped lab, guidance every step of the way, a statistician available for consultation, and a senior student to show me the ropes. Was I ever in for a surprise.

My supervisor and I planned to undertake a project on the analysis of lateral cephalograms. It seemed like a simple project — until we discovered that our analysis program wasn't working properly and had to be rewritten. Instead of using 50-60 patients, as we'd estimated initially, we started to look at 800-1,000. Eventually, one summer's work turned into two, and a simple job became a presentation and a B.Sc. (Dent).

Through it all, I learned a great deal about research.

To me, research is many hours of hard-work with no guarantee of reward in the end. So why do it? As a young boy, I remember reading late at night, hidden under my covers, until I'd finished an interesting book, or refusing to go to bed until I'd solved a difficult math problem. Sometimes curiosity just gets the better of you.

As my oral diagnosis professors keep pounding into my head, it is essential to gather data from many sources before attempting to formulate a definitive diag-



Mr. Terry Wong

nosis. Research is the key. It provides the data necessary to generate new theories or prove existing hypotheses, it leads to the discovery of new knowledge, and it often results in a better way of life for mankind. Little, for example, did Louis Pasteur realize the extent to which his concepts of microorganisms would affect modern surgical techniques.

Finally, research provides a certain amount of personal satisfaction. Knowing enough about a subject to be able to investigate and formulate new ideas brings its own rewards. But while all these things make research worthwhile in the long term, it is still fair to ask what makes the research grind bearable on a day-to-day basis.

In my case, the interaction with colleagues, a sense of self-determination and a number of fringe benefits made the difference. My supervisor was available whenever I needed encouragement or advice on how to solve a problem, and my fellow research students would often talk about the progress they'd made on their projects. But my biggest boost, perhaps, was going to the 1990 CDA convention. There, I met fellow researchers from across Canada, and learned firsthand the results of their hard-work and interest in a specific field.

In research, as in most things in life, you must first ask yourself how much you want to succeed. Just continuing to work on a problem day after day — even if each solution that presents itself leads to another roadblock — advances one's understand-

ing, and will eventually lead to a final solution or to the discovery of another way to tackle the problem.

At times, research can seem as futile as hitting your head against a brick wall. But while your repeated "pounding" often seems to have no effect on the wall, it is in fact breaking it down, and opening the pathway to new knowledge.

And research does have a few perks to offer. In my case, Dentsply Canada Ltd. gave me the opportunity to attend the CDA convention, expenses paid. Besides meeting with fellow students to discuss new research ideas, and talking to the top researchers in the country, I had the chance to do an oral and poster presentation. However, the most important thing, for me at least, was the increased understanding and knowledge I'd acquired by the end of the week.

Just as a blooming flower needs to be seen, a budding seed needs plenty of sunlight, water and nutrients to grow and blossom. I gained valuable sunlight, water and food for thought at the CDA convention, which, hopefully, will stimulate the growth of ideas in my mind. One day, I would like the results of my research endeavors to allow me to share new knowledge with my fellow colleagues, leading to new advances in dentistry. Δ

Editor's Note: Mr. Terry Wong, of the University of Manitoba, earned second place in Dentsply Canada's recent Student Clinician Program, which was held in conjunction with the 1990 CDA Convention in Ottawa. Mr. Wong presented a clinic on "A study in dental cephalometrics."

Did you know?

Dental research in the United States cuts dental costs by more than \$2 billion annually. Dr. Harald Loe, the director of the National Institute of Dental Research (NIDR), recently testified before a U.S. health subcommittee. He said that dental research and the use of fluorides have dramatically reduced caries in children and cut dental costs by more than the total appropriations NIDR has received in its 40-year history.

Current Research in Preventive Dentistry and Its Impact on the Future of Dental Care

D. Christopher Clark, D.D.S., M.P.H.

Introduction

This paper is intended to stimulate thought and focus attention specifically on areas of research in preventive dentistry. It will also point to the large gaps that exist in our knowledge base regarding the use and effectiveness of certain preventive technologies and practices.

There are inherent difficulties in using data from disparate regions of Canada for research analysis, primarily because the pattern and incidence of oral disease may vary to the extent that similar research findings can lead to different conclusions in different places. Therefore, this paper will not be referenced extensively from the scientific literature, but will largely represent the conclusions, opinions and concerns of the author, which, hopefully, are grounded in a knowledge and understanding of current scientific literature in preventive dentistry.¹⁻⁵

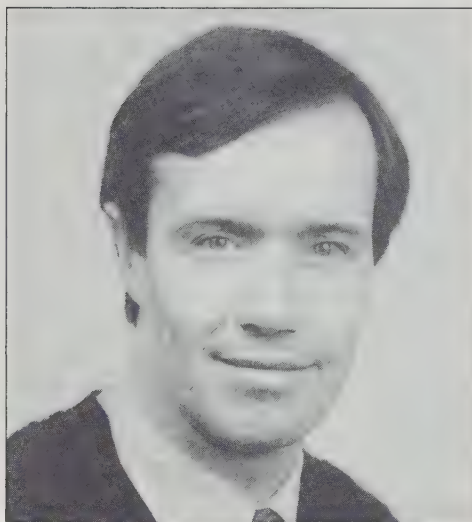
Similarly, this paper is not meant to criticize, but rather to focus attention on the important issues that the profession must consider to keep pace with current changes in preventive dentistry. It will therefore focus primarily on the prevention of dental caries. The prevention and control of periodontal disease will be addressed only in terms of evaluating research on plaque control.

Dental Caries

Prevention of Dental Caries in Children

Throughout the civilized world, the dental profession has received a sizeable share of the credit for the great strides being made in the prevention of tooth decay in children, adolescents and young adults. This isn't surprising, as the ongoing reduction of tooth decay speaks well of our efforts.

However, despite the frequent references made to this reduction and its probable causes in the literature, as well as in continuing education programs, the profession often fails to identify the real reasons behind the phenomenon. For example,



Dr. Christopher Clark

there has been little, if any, growth in the proportion of people receiving fluoridated water in Canada since the mid to late 1960s. Therefore, it would seem to be misleading to imply that the reduction of tooth decay in Canada has resulted solely from the fluoridation of public water supplies. Given this fact, it is certainly valid to ask, then, "What has caused the reduction in tooth decay?"

Most experts attribute the decline to an increased public exposure to fluorides from many different sources. The widespread use of fluoridated dentifrices is a case in point, while the use of other, self-applied systems — notably fluoride supplements and mouth rinses — has probably also played an important role.

The experts almost always cite improved diet and better dental home care as significant factors for decay prevention as well. Furthermore, increased use of pit and fissure sealants in dentistry probably also contributes to the lower caries rates found today.

Whether or not this trend toward an increased exposure to different fluoride technologies will continue is anyone's guess. However, for certain groups of children there seems to be little room for improvement. Their caries rates are

extremely low, and should be expected to remain that way into at least their early adult years.

This scenario begs the question: In the 1990s, how do we prevent dental caries in children and adolescents? First, it is important to re-examine the rationale for the routine use of preventive practices. For example, are there any real benefits to be gained from using a professionally-applied topical fluoride treatment for low-risk children? Should we recommend the daily use of a fluoride mouth rinse? If a child is unlikely to experience more than three or four decayed tooth surfaces by the age of 14, then what do they stand to gain from these preventive practices?

In the average or normal child, caries usually occur in pits and fissures. Decay on these surfaces will, in general, not be significantly influenced by the types of professionally-applied fluoride systems at our disposal today. While this does not suggest the total discontinuation of professionally-applied topical fluorides for these children, there are probably cases where such a consideration is warranted. For example, if a child comes from a family that attends to routine recall visits, and if he or she receives the benefits of daily exposure to systemic fluorides, uses fluoride dentifrice daily, and experiences moderate to low sugar intake, then the added advantage of professionally-applied topical fluoride is probably close to nil. Likewise, the use of commercially-available fluoride mouth rinses in these instances would probably provide few additional benefits.

The advantages of professionally-applied fluoride treatments and the use of self-administered fluoride systems would be quite different for a child who is likely to experience many decayed tooth surfaces. Clearly, the needs of these children, and the benefits offered by various treatment methods, are different than they are for low-risk children. A new set of questions thus presents itself. Given the likelihood of future carious activity, what preventive systems should be put in place for high-risk children? How do we monitor them? Do we prescribe self-administered

fluoride technologies for home use in these instances? How can compliance be improved?

The answers to these questions are difficult to ascertain, but it's likely that many dental professionals don't entertain varied preventive approaches for either children or adults with different levels of caries risk. Clearly, if a patient is experiencing a high incidence of dental caries, then the problem probably originates from a limited use of prevention practices in the home and from the consumption of a cariogenic diet.

Managing the problems of children who are at high risk to dental caries represents a real challenge for a couple of reasons. First, many of our more effective preventive practices necessitate patient and parental cooperation, and often it just isn't there. In these cases, decay prevention is usually best managed within private dental offices or through public programs.

Unfortunately, in the last decade many public dental programs in Canada have suffered, and continued government support for school programs to promote the prevention of dental caries in children is uncertain. Currently, public health administrators are hard pressed just to sustain existing programs. Government has somehow gotten the impression that the problem of dental caries in school children no longer exists. This just isn't the case. Many children still suffer from the ravages of tooth decay. Frequently, these are the children that suffer from other social and environmental problems as well.

The second challenge concerns the nature of dental insurance, which discourages the tight focus that is necessary to deal with some of these children. Rarely, if ever, do third-party dental plans pay for recall visits that occur more frequently than once every six months. Most high-risk children need preventative treatment in dental offices more frequently than this, however, which suggests that the issue of recall intervals must be an ongoing item for discussion between the profession and the insurance industry.

The trap of recalling patients at intervals geared toward insurance coverage instead of basing recall intervals on patient needs creates a three-fold problem. First, a patient's best interests are not well served if the best and most appropriate prevention program isn't offered. Second, the potential for educating patients about prevention — and the requirements of a well-designed insurance plan — are lost if preventive programs are not based on a patient's needs. Last, insurance carriers have regimented recall intervals to contain costs. Until the profession can demonstrate

that recall intervals are based solely on a patient's needs, we will be in a defensive position with regard to encouraging the carriers to adopt a more flexible posture about recall intervals.

Given good patient compliance or a willingness to visit the dental office more frequently, what are the most effective methods for the prevention of tooth decay in moderate- to high-risk children or adolescents? Is improved oral hygiene on the top of the list? Reduced sugar intake? Which fluoride technologies, if any, should be considered?

Unfortunately, the answers to these questions are not easily found in the dental literature. Many of the researchers who traditionally focused their attention on caries prevention for children are now working in new areas. In addition, given the fact that government considers the problem of dental caries in children to be solved, it is hesitant to support research in this area. Consequently, much of the research in preventive dentistry today is sponsored commercially, and in some instances it causes more confusion than progress.

There are, however, some old answers that still hold true. The most cost-effective method for the prevention of dental caries is still the fluoridation of public water supplies. While past claims of caries reduction due to fluoridation were too high, and should no longer be made, there is still good evidence that proves fluoridation is both safe and effective. Unfortunately, promoting the use of fluoridated drinking water is currently difficult in the best of circumstances. In reality, we will be lucky to sustain existing systems.

This isn't to suggest that we should give up. Our code of ethics clearly specifies that our first responsibility is to the patient. Given that the best means of preventing dental caries — the fluoridation of drinking water — still only reaches about half the people in Canada who consume water from public systems, have we sustained our efforts in this regard? I would suggest that we have not. There is no significant initiative from the Canadian Dental Association in this regard, and I suggest that more of us need to actively promote the concept of water fluoridation within our practices.

The results of a recent study conducted by the National Toxicology Program have again fueled public concern over the safety of fluorides in general, and water fluoridation specifically. (This study tested the effects on rodents of consuming water containing 80 times the concentration of fluoride commonly found in optimally-fluoridated public water supplies.) After an

extensive review of these research findings, most experts have classified them as "equivocal," meaning that they are inconclusive. What, then, should patients be told when they ask about safety issues, or more specifically about these particular study results. Most importantly, perhaps, patients should be made aware of the long and positive history of fluorides in the prevention of dental caries. It is also important to tell patients, and the public, that the dental profession continues to investigate fluoride use as well as other important topics. No issue is immune from ongoing scientific scrutiny.

Turning to individualized methods of caries prevention for high-risk children, the use of daily fluoride mouth rinses or daily fluoride gel treatments in custom trays will help to prevent tooth decay. Compliance can be a problem in each case, but is generally a greater problem with the custom fluoride tray treatments — despite their potential to result in greater caries reductions. Either a 0.4 per cent SnF₂ (stannous fluoride), a neutral 0.5 or one-per cent sodium fluoride, or a 0.5 per cent APF gel should be considered. Again, the literature provides little evidence of increased effectiveness for any one of these vehicles. The stannous fluoride has greater antibacterial properties, while the other two vehicles have greater remineralization potential. Nevertheless, if a patient uses any of these custom systems on a daily basis, their problems with dental caries will diminish significantly. There is limited — and somewhat dated — evidence indicating that this treatment procedure would be effective for high-risk adults as well, but hopefully future research will provide further guidance in this respect.

The development of a caries vaccine⁶ and controlled-release fluoride devices⁷ are areas of active research that may become important in the future. Obviously, these systems for decay prevention must address the problem of poor patient compliance. Unfortunately, a number of problems relating to the cost, effectiveness and safety of both systems remain unresolved.

Research findings suggest that diet still influences the occurrence of dental caries in high-risk children and adults. Should ambitious dietary counseling programs be entertained within dental practices, or should patients be referred to nutritionists or dietitians when there are indications that their diet is poor?

What is frightening is the suggestion that these high-risk children are treated in much the same way as low-risk children. Are we failing to address an important component in the caries-risk equation? Does training in nutrition adequately prepare dentists to

counsel patients, or is it superficial, providing dentists with little opportunity to develop clinical confidence and experience in this area?

Pit and Fissure Sealants and the Prevention of Dental Caries

When should a pit and fissure sealant be considered? On what children or teeth, and under what sets of circumstances? Controversy on when to use this technology seems to exist at the extreme limits of caries experience. For children that will remain caries free, there are no benefits to be gained from the application of a sealant. To cite an example, primary pit and fissure decay usually occurs within two years after eruption. If the tooth has been caries free for 10 years, a sealant under most circumstances will be of questionable value.

For high-risk children, who do not comply with preventive recommendations and who are likely to experience extensive interproximal decay, the use of sealants is also deemed to be controversial. In particular, are there benefits to be had by sealing an occlusal surface if it will have to be replaced with a two- or three-surface restoration involving smooth surfaces a year or two later? There are some who would suggest that this is a waste of time and money. For others, there is still an inclination to perform preventive procedures when the possibility exists of saving a child's tooth surfaces or teeth.

So, do the experts agree on when to recommend the application of sealants? If pit and fissure decay seems likely, either on the permanent or primary teeth, and the child's teeth have deep pits and fissures, then the application of a sealant is warranted as soon as possible after eruption. If a pit and fissured surface shows early signs of carious activity, then the use of a sealant or a conservative posterior composite covered by sealant material is indicated.

After a dentist has observed the natural course of events in a child's first permanent molars, better predictions can be made about caries risk in bicuspid and second molars. Surveys involving children and adolescents show that occlusal decay in premolars, and to some extent in second molars, is rare. Therefore, the routine use of sealants for these surfaces must be questioned. Nevertheless, a dentist's clinical experience and careful consideration of a patient's probable level of future caries risk should result in sound decisions on the use of pit and fissure sealants for children and adolescents.

Research on sealant effectiveness has also confirmed that caries prevention is

almost certain on a particular surface when the sealing procedure is performed properly. However, findings from longitudinal studies continue to reflect failure rates in the range of 25 per cent to 40 per cent. When failures take place, reapplication will be necessary or decay may occur. Parents should be informed that sealants can fail, and therefore should be inspected periodically. When these requirements aren't met, sealant application may provide patients and parents with a false sense of security.

Caries Risk Assessment

During the last 10 years, considerable research has been focused on finding a means to predict caries risk in children and adults. This work has shown that the only good indicator of caries risk in children is the educational level of their parents. Research also seems to indicate that sugar ingestion no longer helps to predict caries occurrence for normal or low-risk children. While surveys continue to show that many of the children in our practices will experience little or no dental caries, a significant proportion of children, from 20 per cent to 25 per cent, will have serious problems with tooth decay.

Despite the fact that preventive dentistry is changing, most of the best techniques for decay prevention have been around for some time. What has changed, and I believe will continue to change, is our ability to assess risk. Ascribing risk to individual patients will permit us to focus our efforts on those in need. For the many who have little or no oral disease potential, the aggressive use of many of the current technologies will be inappropriate.

For adults and elders, the use of certain medications, the cariogenicity of the diet and the bacterial flora, and both the stimulated and resting salivary flow rates have been identified as possible predictors of caries risk. While these indicators of future caries activity, on both coronal and root surfaces, are far from perfect, there are sufficient data for them to provide some guidance.

If, for example, a patient indicates that he or she takes numerous medications, the dentist should refer to the *Compendium of Pharmaceuticals and Specialties* (CPS), which will suggest when the likelihood of xerostomia will exist. If two or more of these medications are thought to cause xerostomia, then this patient will likely need special attention. If he or she has frequent sugar ingestions during the day (greater than 10 or 12), then the risk of caries activity increases still further.

If it is possible for the dentist to take a stimulated saliva sample and have it analyzed for counts of *Strep mutans* and *lac-*

tobacillus, then still greater predictability is possible. Any count of over one million bacteria per millilitre is a danger signal. Furthermore, if a patient is unable to produce an unstimulated or resting saliva sample over a three-minute period, then this is suggestive of severe xerostomia.

Unfortunately, there is little evidence to suggest that these risk-assessment measures are used routinely in dental practice today. The microbiological assessment service at The University of British Columbia is used by only a few practitioners. How many dentists actually take salivary flow rates and know how to interpret them? Unfortunately, few of us were taught these techniques during our formal dental education, and the availability of good continuing education courses in preventive dentistry is limited. To my mind, the area of caries risk assessment is crucial to the provision of appropriate preventive care for adult patients. This is particularly true for debilitated, elderly patients, who are increasingly in need of dental care.

Prevention of Dental Caries in Adults

If high-risk adults or elders are identified, some of the same rules in place for high-risk children should apply concerning the benefits of fluoride technologies. Used daily, fluoride gels in custom trays appear to be the most effective fluoride system available for preventing dental caries. The daily use of fluoride mouth rinses is also effective, and will likely produce the best patient compliance. In addition to — or in conjunction with — the self-applied fluorides, chlorhexidine might also be considered.

This anti-bacterial agent has been demonstrated to reduce caries experience. It can be used over a long term with no apparent concern about toxic effects; however, taste and staining problems will often force the selection of another preventive agent. (Few patients will tolerate these side-effects on a long-term basis.) Still, there is evidence to suggest that the use of a chlorhexidine system reduces the pathogenicity of the bacterial flora in the mouth. This points to the advantages of a patient periodically using a chlorhexidine solution (0.2 per cent) to keep levels of cariogenic bacteria down, and then using one of several fluoride systems during the interim.

Caries activity tests, specifically for *Strep mutans* and *lactobacilli*, can be used to determine when chlorhexidine is needed. Research suggests that daily treatments for 10 days to two weeks can significantly reduce bacterial counts. In patients with severe caries problems, the combination of

chlorhexidine and fluoride treatment may be our best line of defense. Unfortunately, no commercially available chlorhexidine product is marketed in Canada. The product must, therefore, be formulated by a pharmacy. Increasingly, however, pharmacies, especially those with close connections to large acute-care hospitals, are becoming familiar with the formulations.

Another chlorhexidine vehicle has been tested successfully at the University of Toronto.⁸ Investigators there have incorporated chlorhexidine into a varnish that can be professionally applied. Results to date suggest that this system can practically eliminate *Strep mutans* from the saliva of infected patients for over six months. Currently, special permission must be obtained from the Health Protections Branch of Health and Welfare Canada to use this system; however, it is likely that commercial clearance will be forthcoming soon. This technique shows great promise for high risk individuals, and is therefore worth looking for in the future.

Periodontal Disease

Periodontal disease refers specifically to several different disease entities. Therefore, a discussion of the prevention of periodontal diseases must operate at several different levels, and consider primary versus secondary or tertiary prevention. Also, the causes of periodontal disease are different for the various diseases, therefore primary prevention for one may not apply to another. Not surprisingly, considerable research has focused on the pathogenicity, natural history, measurement and treatment of periodontal diseases. In this brief paper it is impossible to cover these topics in any depth. Nonetheless, several important areas of research are worth mentioning.

The destruction of the supporting structures of the periodontium was once thought to occur over time in a slow and progressive nature. Recent research suggests this is not the case. In fact, the progression of periodontal disease probably occurs in short bursts, with long periods of stability or remission between periods of disease activity. Considerable efforts are now being expended to identify these periods of activity so that prevention and treatment procedures can focus on the real causes of disease. To date, no clear answer has surfaced.

It is probably only a matter of time before a test designed to determine if a patient is in an active period of periodontal destruction becomes available. When this happens, it may revolutionize periodontal treatment. Until then, however, the management of the disease will continue to rely

on the reduction of plaque accumulations, the removal of local etiological factors and the correction of deformities in the periodontium caused by the disease. In this vein, the literature has shown that frequent periodontal recall visits can maintain periodontal health in most instances. Furthermore, the success of periodontal surgery depends on good patient compliance with rigorous home care. In certain situations, the use of systemic and locally-applied antibiotics have demonstrated effectiveness in maintaining periodontal health. There are limitations to the use of systemic antibiotics, however, although their use may well be increasingly important as our ability to detect periods of periodontal disease activity increases.

Improving the motivation of patients to care for their teeth and comply with their dentists' recommendations for home dental care have demanded considerable attention by the profession. The success of our efforts in this regard, however, is often less than ideal. Regular and effective plaque control is demanding and necessitates routine follow-ups by professional staff if it is to be sustained. There is evidence, however, that rigorous recall programs for periodontal maintenance have lessened the severity of disease. The costs for this treatment vehicle are considered by many to be high. Not all patients will make frequent visits to dental offices for intensive periodontal maintenance. Many people who have periodontal disease would prefer an easier and, possibly, more effective means of controlling or preventing periodontal disease.

With early access to anti-calculus, anti-plaque and anti-inflammatory agents, as well as new, high-tech, mechanical oral hygiene aids, consumers have a myriad of home products available to them, all of which claim to prevent and/or control the causes or progression of periodontal diseases. Ongoing research on these agents has generated considerable debate and some controversy in regards to their approval by the profession. But given the commercial monies that are being poured into research in this area, new agents and innovations can be expected in the future.

For the minority of patients with aggressive periodontal disease, the need for recalls at least once every three months has not been replaced by any of the currently marketed agents or systems claiming to improve periodontal health or prevent disease. While this could change, commercially-sponsored research is full of data which indicate statistical — but not clinical — significance in health outcomes. Great care is needed to assess this body of knowledge. To date, no alternative to

rigorous professional care seems to have surfaced for those with serious periodontal problems.

Summary

To my mind, preventive dentistry has not changed all that much in the last 10 to 15 years. No miracle drug has come on the scene to prevent periodontal disease. There is no caries vaccine to eliminate dental caries. Interestingly, it has been the traditional technologies that have, given the advantage of time, proven their potential. The reality seems to have surpassed even our most optimistic expectations. But while we have learned how to effectively implement these technologies in many instances, the promotion of water fluoridation has lagged. Nevertheless, the improvements in oral health speak well of the work of our predecessors, who shaped the world of modern dental care. It is up to the profession to use existing preventive technologies to their best advantage and to devise even better preventive measures for the 20 per cent to 30 per cent of the population who are at highest risk of caries and periodontal disease.

This paper has focused on some points of interest that have been published in the dental literature on preventive dentistry. Other issues represent concerns of the author. I invite comment and discussion on the topics and issues that were raised. Dialogue is healthy. Δ

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References

1. Burt, B.A. Ed. Proceedings for the workshop: Cost effectiveness of caries prevention in dental public health. Ann Arbor, Michigan, 1989.
2. Krasse, B. *Caries Risk*. Chicago, IL. Quintessence Publishing Co., Inc. 1985.
3. Report of the ad hoc Subcommittee on Fluoride of the Committee to Coordinate Environmental Health and Related Programs. Review of Fluoride. Benefits and risks. Department of Health and Human Services, Public Health Service, February, 1991.
4. Ripa, L.W., Chairman, Task Force. Massachusetts Department of Public Health. Preventing pit and fissure caries: a guide to sealant use. 1986.
5. Symposium on appropriate uses of fluoride in the 1990s. Annual Meeting of the American Association of Public Health Dentists, Boston, MA. October 10-13, 1990.
6. Moro, I. and Lehner, T. Symposium Report: sixth international congress of mucosal immunology: dental caries vaccines. Tokyo, Japan, July 23, 1990.
7. Corpron, R., Merrill, J., Clark, J., et al. Remineralization of root lesions *in vivo* using a fluoride-releasing device. *J Dent Res*, 68:372, 1989.
8. Sandham, H.J., Brown, J., Phillips, H.I., and Chan, K.H. A preliminary report of long-term elimination of detectable *mutans Streptococci* in man. *J Dent Res*, 67:9-14, 1988.

Current Research in Implantology and its Future Impact

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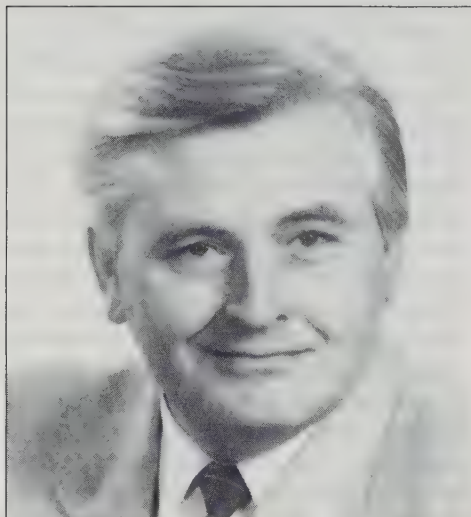
Introduction

The earliest alloplastic endosseous implants discovered to date — found in a fragment of a mandible dating from about AD 600 — were unearthed by Dr. and Mrs. Wilson Popenoe during the 1931 evacuation of an archaeological site in Honduras. Made from tooth-shaped pieces of shell, the three inserts were located in the sockets of three missing lower incisor teeth. While it was believed at the time that the shell was inserted after the recipient's death, X-rays taken in 1970 showed compact bone development around two of the implants and this bone was radiographically similar to that which is found around modern-day functioning endosseous implants.

Now located in the Peabody Museum of Archaeology and Ethnology at Harvard University in Cambridge, Massachusetts, the "Popenoe" mandible fragment contains our earliest known example of a presumably successful endosseous implant operation on a living person. Irrespective of whether these implants were placed before or after death, a controversy that probably can't be resolved, the jaw fragment is a testament to the ingenuity of the Mayan people, and demonstrates that the idea of implanting artificial tooth forms dates from ancient time.

More recently, many attempts to develop dental implants have met with limited success because of a failure to understand the body's biologic response to implanted material and implant design.

The breakthrough came in a paper published by Branemark in 1969,² which set the stage for an explosion in scientific research in dental implantology and its prosthodontic applications. This led to large numbers of research endeavors designed to investigate basic science and clinical questions that could influence implant success. Probably no other area in dentistry, except for chemical bonding to calcified dental tissue, has generated so much research activity. As a result of developments in the past few years, at least 35 root-form implant systems have been introduced to the American market.



Dr. Philip Watson

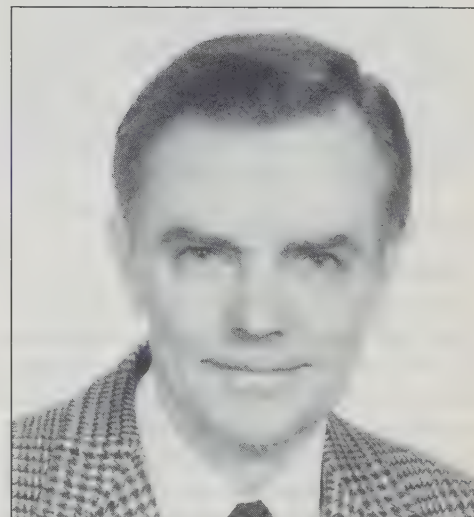
A few of these have received official sanction for clinical use, but for the majority there is little scientific evidence of safety and efficacy. Obviously, this paper can examine only a small selection of items from this collection of information. Therefore, only some of the developments felt to be of significant interest to dentists in clinical practice will be presented.

Longitudinal Clinical Studies

There are many reported clinical studies involving the Branemark implant system. Only a few of these, which are felt to parallel performance in clinical practice, are presented. The success of osseointegration is generally reported in terms of implant-survival studies over a specified period of time. Because there may be differences in successful treatment between edentulous and partially edentulous patients, due to ecological differences, these will be discussed separately.

Edentulous Patients

Although treatment of the edentulous patient has been extensively reported, longitudinal studies with improved criteria for evaluation are in progress to characterize the performance of Branemark implants over long periods of clinical service. The



Dr. Peter Apse

Toronto Study,^{3,4} started in 1979, has followed 46 edentulous patients by defined criteria. This study is useful for clinical dentists for two reasons. First, while taking into account that a mandibular bone must be at least 10 millimetres (mm) in height to accommodate a Branemark implant, "the selected patient treatment group was almost entirely made up of patients with unfavorable jawbone quality and quantity features." Second, patients in this group were treated during the so-called "learning curve." These two factors closely simulate the conditions experienced by the majority of clinicians beginning implant treatment.

The survival data for the study included implants in place for four to nine years. Of 274 implants inserted, 89.05 per cent have been retained, although this included nine implants which were unfavorably located and left as "sleepers" within the jaw bone under healed mucosa. Excluding sleepers, 85.77 per cent of the implants have been retained in function.

It is noteworthy for the clinician that failure of at least one implant affected 29 per cent of the 49 arches treated. Nevertheless, each patient was able to wear a prosthesis successfully during the four- to nine-year period of observation, although some of these prostheses were revised or replaced. This underscores the importance of report-

ing not only the percentage of successful implants, but also the percentage of patients affected by the loss of one or more implants. It is crucial that patients understand the probability of losing one or more implants and that revisionary treatment may be required.

A Swedish report⁵ is another one that should parallel experience in clinical practice. This study evaluated 4,100 implants that were placed in the jaws of 600 patients. About 900 of these implants were inserted in 150 jaws at several other centers where osseointegration was used regularly. They report a six- to 10-year survival rate for 81 per cent of the implants placed in the maxilla and 91 per cent for those placed in the mandible.

Partially Edentulous Patients

Clinical research on the treatment of partially edentulous patients has expanded rapidly in the past few years, and has focused mainly on characterizing the performance of Branemark implants used to support free-standing prostheses that are not connected with natural teeth. The most comprehensive report is from Sweden, where 867 implants were placed in the partially edentulous jaws of 244 patients between April 1968 and December 1988.⁶ The bulk of the patients were treated from 1981 to 1987.

Only nine patients were evaluated between 1968 and 1981. The success rate for loaded implants in this early group was 79 per cent and 92 per cent respectively for the mandible and the maxilla after 10 years. The researchers do not consider this early group representative because "patients were treated without any consistency with regard to hardware components and/or surgical technique used."

In the second group of patients, treated between 1981 and 1987, the overall success rate of implants on 111 patients was 94 per cent in the maxilla and 99 per cent in the mandible. The average observation period of the implants evaluated in this group was 2.5 years.

The remainder of the patients comprise a third group, with prostheses in place for less than one year. No conclusions are presented from this group.

In another study, a retrospective evaluation was made of 38 patients from six centres. The observation time ranged from six to 36 months. Reportedly, "the success rate for the individual fixtures in the upper and lower jaws was 87 per cent and 92 per cent respectively."⁷ The author of this report felt that some of the failures could be attributed to the fact that some of the implant teams involved had just

started treating partially edentulous patients. Nevertheless, these figures should not be ignored, because they may be realistic indications of the expected rate of success for most dentists beginning implant treatment.

Mixed Support Implant Treatment

When a combination of implants and natural teeth support a rigidly-fixed prosthodontic restoration, there is a risk of biomechanical complications because of the fundamental difference in the mobility of the abutments. This phenomenon needs to be investigated further. Carefully designed studies should be initiated to define the effect of variables such as the numbers and positions of supporting teeth; crown to root ratios; tooth mobility; and periodontal health on implant performance.

A major problem for investigators is the many variables associated with the natural teeth, which may affect the overall performance of the treatment. Current reported research involves patient populations too small to justify conclusions. In one study of 10 patients, six patients were treated with implant abutments rigidly connected to tooth abutments.⁸ In the remaining four patients, the implant abutments supported restorations joined to the tooth abutments with non-rigid connectors.

Unfortunately, the observation time was short (six to 30 months). The authors report that "no failures of importance have so far occurred," but because of the short observation period and small number of patients it is "not possible to make recommendations regarding the most suitable technical design for this type of bridge restoration." Research in this area is required to determine if mixed-support treatment is feasible with conventional implant designs, or if new systems capable of functioning in harmony with the biomechanical characteristics of natural teeth are required.

Research with Potential for Future Impact on Clinical Treatment

Current implants have many limitations, which are generally well known to implant practitioners. The failure rate, while it is considered acceptable, is not preferable. Root-form implants require considerable bone depth over anatomic structures such as the mandibular nerve canal and the maxillary sinus, thus restricting their use in most cases to the anterior part of the mouth. They also require adequate facial-lingual bone width in order to avoid per-

forating or weakening cortical bone plates during placement. Prosthodontic restoration is complicated, particularly in the anterior region where current implant designs create significant aesthetic and oral hygiene problems. Future studies on microbiology, materials and design, surface chemistry and cellular response to implant materials will surely enrich our understanding of the biomechanical requirements.

Influence of Implant Design on Bone Remodelling

Resorption of crestal bone occurs to a degree with all current endosseous dental implants. The successful osseointegrated implant developed by Branemark and co-workers loses about 1 mm of crestal bone adjacent to the implant during the first year and about 0.1 mm per year thereafter.⁹ This has been reported to be acceptable on the basis that these implants have performed adequately over long periods of observation despite bone loss.

Although this rate of bone loss may be acceptable, however, incremental bone loss is not desirable. Some bone loss may occur initially in the wound site as a natural healing phenomenon caused by second-stage surgery, but in the absence of mucosal inflammation this should not lead to continued bone loss years after implant placement. There are two other possible causes of crestal bone loss. Local tissue infection and abnormal mechanical stresses, which act on the crestal bone around the implant, leading to either disuse atrophy from very low stress, or localized microfracture and resorption from very high stress. There are good indications that crestal bone remodelling can be influenced through the design of dental implants.

Pilliar et al.,¹⁰ using radiology and histology as a means of evaluation, observed differences in bone remodeling around three different endosseous dental implant designs after considerable periods of function in dog mandibles. The authors suggest "that these differences are a result of the different stress states that develop in bone surrounding the three designs." This underscores the importance of implant design on bone remodeling, and suggests that research may result in implant designs capable of stabilizing crestal bone resorption and maintaining stable bone levels for long periods of function. Bone remodelling in response to loading will occur and implant designs which provide appropriate stress transfer to the supporting bone will influence clinical success. Finite element stress analysis, an advanced

computer-assisted method of structural stress analysis developed for engineering mechanics and applied in orthopedic research, may also assist in the development of new implant designs with biomechanical advantages for uniform stress transfer to bone at the implant-bone interface.¹¹ It is possible that present implant designs may benefit from minor modifications in design and that new implant designs will emerge which are quite different from those in current use.

Porous Surface Coatings

Metal implants with porous surface coatings were developed by Pilliar and are currently used successfully for a number of orthopedic applications.¹² The porous coating is formed by sintering Ti6AL4V (Titanium-Aluminium-Vanadium) spherical alloy powder particles (44- to 150-micron size range) to a machined implant core made from the same alloy. By vacuum sintering at 1,250°C for two hours, a well-bonded coating with interconnected pores (35 to 40 per cent porosity, 80- to 100-micron average pore size) results. The porous coat produces a surface geometry which permits implant fixation by bone ingrowth in a relatively short time period (four weeks in dog mandibles).¹³ This technology has been adapted to a new dental implant design, which has been developed at the University of Toronto through laboratory and animal testing. The new implant design is currently being tested in a human clinical trial involving 52 treated patients.

Hydroxyapatite Plasma Spray Surface Coatings

There is keen interest in the possible use of hydroxyapatite plasma spray coatings on titanium and titanium alloy implants, since this technology exhibits the potential of providing more rapid development of strong bonding at the bone-implant interface.^{14,15} Furthermore, after 10 months of loading, animal studies show more bone contact along the surface of the hydroxyapatite-plasma coated implants as compared to non-coated controls.¹⁶

Hydroxyapatite (HA) is thought to provide an osteo-conductive surface for bone healing and bonding at the HA-bone interface.¹⁷ These coatings may help to reduce crestal bone loss, under certain conditions, on endosseous dental implants, as suggested by the results of a 20-month study of loaded implants *in vivo*.¹⁸ However, in this study HA coatings appeared to undergo considerable degradation, although this is not necessarily detrimental to the bone implant interface.

Some implants are being marketed with a 50- to 80-micron thick (approximately) coating of HA. Until the clinical performance of implants with these coatings is characterized in human experiments, the significance of HA coatings for clinical practice will remain unknown. Although bond strengths at the HA-implant interface are considered adequate, there are, nevertheless, lingering reservations.

Titanium Plasma Spray Surface Coatings

Titanium plasma spray-coated implant surfaces are produced by the application of pure titanium in a powder form by an electric arc temperature of 15,000-20,000°C and a high-velocity argon gas-jet, which creates a rough surface approximately 0.03 to 0.04 mm thick. This surface, when compared to control surfaces, is reported to increase the load bearing capacity by about 30 per cent.¹⁹ When performed correctly, the coating process produces a rough titanium veneer that appears to be adequately bonded to the substrate metal. Implants currently marketed with this surface design require longer-term clinical trials to characterize performance.

Single Surgery Implant Techniques

Obviously, an implant system that could be placed in one surgical operation as opposed to the two operations currently required for the standard two-stage implants would be attractive for patients. Single-stage surgical implants are, in general, currently not advised. Non-submerged implants are exposed to oral microflora and at least a certain degree of loading during the critical early healing stage. Early loading may result in uncontrolled and unacceptable movement at the bone-implant interface, leading to an increased probability of fibrous tissue formation, instead of bone, against the implant surface. Alternatively, the hollow basket titanium spray-coated implant²⁰ and the single crystal sapphire (aluminium oxide) screw²¹ are single-stage implants that are reported to provide enough stability during early healing to allow bone ingrowth into surface irregularities and holes. A recent report²² evaluating the healing of submerged and unsubmerged plasma titanium spray-coated implants in monkeys reported no "radiographic differences in the healing response between submerged and nonsubmerged implants" in a 21-week test period, when plaque scores

were minimal. Maintaining low plaque levels appeared to be essential to this success.

Mucosal Considerations in Implant Success

Teeth and dental implants are two isolated examples of structures which pierce the integument of the jaw. The attachment of oral mucosal epithelia to dental implants constitutes the primary sealing mechanism of mucosa to metal, and may be an important component in determining the long-term success or failure of the implant. While there are few available data on the biology of the epithelium that surrounds dental implants, the common origins of the epithelial cells mediating attachment to tooth and implant, and the fact that both implants and teeth are bathed in saliva, and both are colonized by bacterial flora of similar composition, provides enough common ground to suggest that both tooth and implant sites are subject to the same physical and biological challenges.

Loss of bone subjacent to peri-implant mucosal tissues has been reported to occur around most implant systems. Although such bone loss is generally very small (mean = 0.1 mm per year after the first postsurgical year), sites occasionally demonstrate much greater amounts of loss. Two theories have been proposed to explain rapid loss of peri-implant bone: mechanical overloading or underloading of the crestal bone; and bacteria-initiated disease. Strong evidence supports the fact that microorganisms present in the dental plaque found in the region of the gingival sulcus or periodontal pocket, or substances derived from them, constitute the primary extrinsic etiological agent in gingival and periodontal disease.²³ Although very little is known about the relationship of oral microflora and peri-implant mucosa, extensive information is available from periodontal literature, which may be extrapolated to the transmucosal implant.

The relationship between the peri-implant mucosa and the indigenous oral microflora is in the initial stages of investigation, particularly in terms of the pathogenesis of implant failure. Because of the lack of any evidence of bacteria-induced peri-implant disease, the associations are generally drawn from information in the periodontal literature. There is weak evidence that plaque accumulations cause inflammation of the peri-implant mucosa analogous to gingivitis.^{24,25} Furthermore, it has been observed that rapid loss of bone can occur with concomitant peri-implant sulcus deepening. This, in turn, has been equated with periodontal disease.

Although such associations are hypothetical at this stage, the presence of known periodontal pathogenic organisms in the implant sulcus suggests that these sites be considered at risk until a clearer relationship can be established.

In a recent study,²⁶ dark field microscopic investigations of bacterial morphotypes at healthy implant sites compared favorably with compiled values of similar investigations from periodontal sites. High proportions of coccoid cells and low proportions of motile rods and spirochetes were associated with periodontal health, whereas higher proportions of motile rods and spirochetal microbes were recovered from diseased sites. Although similarities in the relationship between changes in the microflora and disease progression have not been demonstrated in peri-implant mucosa, implant sites yield microflora of similar morphotypic proportions to those found in healthy dentate sites.

The presence of putative periodontal pathogens at implant sites may, by inference, imply that they are capable of causing disease there, although such an association has not been shown. Black-pigmented *Bacteroides* have been identified at implant sites in a number of studies. Apse et al.²⁶ demonstrated the presence of *B. gingivalis* and *B. intermedius*, among others, in both edentulous and partially edentulous mouths, although none of the sites showed any clinical evidence of tissue breakdown. *Capnocytophaga*, *Eikenella corrodens*, *Wolinella recta* and *Bacteroides gracilis* have been isolated from implant sites in a number of studies,^{26,27,28} but no clear association with tissue breakdown has been made.

In summary, the microflora in the clinically healthy peri-implant sulcus appears similar to that found in the clinically healthy gingival sulcus and may include bacteria implicated in periodontal disease. However, a correlation between the presence of pathogenic bacteria and peri-implant disease has not been demonstrated.

Conventional periodontal indices such as plaque index, gingival index, probing depth and width of attached gingiva do not appear to be important diagnostic criteria for determining the success of osseointegration. However, it is possible that plaque-induced inflammation could explain, in part, the slow, progressive loss of crestal alveolar bone which occurs around clinically successful osseointegrated implants. It is also possible that conventional periodontal indices are not appropriate for assessing the health or the level of attachment of the peri-implant tissues.

Microbial Morphotypes in Healthy Osseointegrated Implant Sites in Edentulous Patients

% Microbial Morphotype	Adell et al. ³	Lekholm et al. ⁵	Apse et al. ⁴	Mombelli et al. ⁶	Tooth sites
Coccoid cells	88.9	88.5	84.1	82.2	70.4
Motile rods	2.9	0.6	2.5	1.4	2.8
Spirochetes	2.4	1.9	0.6	0.0	5.9
Others	5.8	9.0	12.8	16.4	20.9

Surface Chemistry, Surface Topography and Cell Biology

Cell behavior in response to variables such as surface chemistry, surface topography, mechanical stress and micromotion ultimately determines both the early healing response and the long-term success of implanted materials.²⁹ Therefore, better understanding of the relationship between cell response and physical and chemical characteristics is required in order to refine current implant designs or develop new systems in a rational manner. Davies et al. have demonstrated the formation of bone-like tissue on solid titanium *in vitro* with an interface which bears close morphological similarities to the interface that develops *in vivo*.³⁰ Other findings suggest that the surface micro-topography of an implant can influence the type of tissue that forms at the interface.³¹

D.M. Brunette,³² summarizing his work and that of others who have examined the effects of implant surface topography on the behavior of cells, illustrates many pronounced effects of surface design on cell attachment, orientation and migration. The possible contributions to implant treatment from a better understanding of cell behavior toward specific chemical and topographical characteristics cannot be over estimated. In the future, it may be possible to design implants with specific chemical and physical surface characteristics that will influence cells to respond in a predetermined manner.

Therefore research in these areas is likely to have profound effects on implant treatment in the future. Δ

References

1. Ring, M.E. Dentistry: An Illustrated History. The C.V. Mosby Co. St. Louis, Toronto, Princeton. 1985.
2. Branemark, P.I., Adell, R., Breine, U., et al. Intra-osseous anchorage of dental prostheses. 1. Experimental studies. *Scand J Plast Reconstr Surg* 3:81-100, 1969.
3. Zarb, G.A. and Schmitt, A. The longitudinal clinical effectiveness of osseointegrated dental implants. The Toronto study. Part I: Surgical results. *J Prosthet Dent* 63:451-7, 1990.
4. Zarb, G.A. and Schmitt, A. The longitudinal

clinical effectiveness of osseointegrated dental implants: The Toronto study. Part II: The prosthetic results. *J Prosthet Dent* 64:53-61, 1989.

5. Adell, R. Clinical results of osseointegrated implants supporting fixed prostheses in edentulous jaws. *J Prosthet Dent* 50(2):251, 1983.

6. Jemt, T., Lekholm, U., and Adell, R. Osseointegrated implants in the treatment of partially edentulous patients. A preliminary study on 876 consecutively placed fixtures. *Int J Oral Maxillofac Implants* 4:211-217, 1989.

7. van Steenberghe, D. A retrospective multicenter evaluation of the survival rate of osseointegrated fixtures supporting fixed partial prostheses in the treatment of partial edentulism. *J Prosthet Dent* 61:217-23, 1989.

8. Ericsson, I., Lekholm, U., Branemark, P.I., Lindhe, J., Glantz, P.O., and Nyman, S. A clinical evaluation of fixed-bridge restorations supported by the combination of teeth and osseointegrated titanium implants. *J Clin Periodontol* 13:307-312, 1986.

9. Cox, J.F. and Zarb, G.A. The longitudinal clinical efficacy of osseointegrated dental implants: A 3-year report. *Int J Oral Maxillofac Implants* 2:91-100, 1987.

10. Pilliar, R.M., Deporter, D.A., Watson, P.A., and Valiquette, N. Dental implant design-Effect on bone remodeling. *J Biomedical Materials Res* 25:467-83, 1991.

11. Vaillancourt, H., Johnson, W.R., Pilliar, R.M. A finite element model for porous implants. Development and Design with Advanced Materials. Ed. G.C. Sih, S.V. Hoa and J.T. Pindera. Publ. Elsevier Scienc B.V., Amsterdam, pp. 207-218, 1990.

12. Pilliar, R.M. Porous-surfaced metallic implants for orthopaedic applications. *J Biomed Mater Res* 21A:1-33, 1987.

13. Deporter, D.A., Watson, P.A., Pilliar, R.M.P., Melcher, A.H., et al. A histological assessment of the initial healing response adjacent to porous-surfaced, titanium alloy dental implants in the dog. *J Dent Res* 65:1071-1077, 1986.

14. Ducheyne, P., Hench, L.L., Kogan, A., Martens, M., Bursens, A., Mulier, J.C. Effect of hydroxyapatite impregnation on skeletal bonding of porous coated implants. *J Biomed Mater Res* 14:225-37, 1980.

15. Dennissen, H.W., Kalk, W., deNieuport, H.M., Maltha, J.C. and van de Hooff, A. Mandibular bone response to plasma-sprayed coating of hydroxyapatite. *Int J Prosthodontics* 3(1):53, 1990.

16. Block, M.S., Finger, I.M., Fontenot, M.G., Kent, J.N. Loaded hydroxylapatite-coated and grit-blasted titanium implants in dogs. *Int J Oral Maxillofac Implants* 4:219-225, 1989.

17. Bagambisa, S., Joos, U., Schilli, W. The interaction of osteogenic cells with hydroxylapatite implant materials *in vitro* and *in vivo*. *Int J Oral Maxillofac Implants* 5(3):217, 1990.

18. Pilliar, R.M., Deporter, D.A., Watson, P.A., Pharoah, M., Chipman, M., Valiquette, N. deGroot, K. The effect of calcium phosphate coatings on crestal bone remodelling. I.A.D.R. abstr. #836, *J Dent Res* 69(Special Issue): 213, 1990.
19. English, C.E. Implants. *J California Dent Assoc* Jan, p. 18, 1988.
20. Schroeder, A., Zypen, E., Stich, H., Sutter, F. The reactions of bone, connective tissue and epithelium to endosteal implants with titanium sprayed surfaces. *J Maxillofac Surg* 9:15, 1981.
21. McKinney, R.V., Steflik, S.E., Koth, D.L. The biologic response to the single-crystal sapphire indosteal dental implant: Scanning electron microscopic observations. *J Prosthet Dent* 51:372, 1984.
22. Gotfredsen, K., Hjorting-Hansen, E., Budtz-Jorgensen, E. Clinical and radiographic evaluation of submerged and nonsubmerged implants in monkeys. *Int J Prosthodontics* 3:463-69, 1990.
23. Newman, M.G. The role of Bacteroides melaninogenicus and other anaerobes in periodontal infections. *Rev. Infect. Dis.* 1:313-323, 1979.
24. Cox, J. The longitudinal clinical efficacy of osseointegrated implants. Thesis, University of Toronto. 1984.
25. Adell, R., Lekholm, U., Rockler, B., Brane-mark, P.I., Lindhe, J., Eriksson, B., and Sbordone, L. Marginal tissue reactions at osseointegrated titanium fixtures. (I) A 3-year longitudinal prospective study. *Int J Oral Maxillofac Surg* 15:39-52, 1986.
26. Apse, P., Ellen, R.P., Overall, C.M. and Zarb, G.A. Microbiota and crevicular fluid collagenase activity in the osseointegrated dental implant sulcus: A comparison of sites in edentulous and

- partially edentulous patients. *J Periodont Res* 24:96-105, 1989.
27. Lekholm, U., Ericsson, I., Adell, R. and Slots, J. The condition of the soft tissues at tooth and fixture abutment supporting fixed bridges. *J Clin Periodontol* 13:558-562, 1986.
28. Mombelli, A., Van Oosten, M.A.C. Schürch, E. and Lang, N.P. The microbiota associated with successful or failing osseointegrated titanium implants. *Oral Microbiol Immunol* 2:145-151, 1987.
29. Ratner, B.D. Surface Characterisation of

- Biomaterials. Elsevier, Amsterdam, 1988.
30. Davies, J.E., Lowenberg, B., Shiga, A. The bone-titanium interface *in vitro*. *J Biomed Mater Res* 24:1989-1306, 1990.
31. Davies, J.E., Pilliar, R.M., Smith, D.C., Chernicky, R. Bone interfaces with retrieved Alumina and hydroxyapatite ceramics. To be presented at the Fourth International Symposium on Ceramics in Medicine. London, U.K. Sept. 11-13, 1991.
32. Brunette, D.M.: The effects of implant surface topography on the behavior of cells. *Int J Oral Maxillofac Implants* 3:231-246, 1988.

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- Détenir ou s'engager à obtenir un Ph.D. en épidémiologie ou en santé communautaire
- Maîtriser la langue française.

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- Maîtriser la langue française.

TRAITEMENT

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Research Feature

Dental Lasers and Science

Kenneth L. Zakariasen, D.D.S., M.S., Ph.D.
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Introduction

The health care professions are distinguished by the extensive scientific foundations that underlie them. These foundations are the result of extensive research and development efforts, and must be continually built on for a profession to move forward. A credible dental profession cannot, therefore, allow the proliferation of poorly-tested techniques and materials within its domain. Doing so would violate the trust the profession has solicited from society. Despite this, improperly-tested devices and materials have been promoted to our profession, and all of us have been disappointed when these devices and materials failed to perform adequately in a clinical situation. Such occurrences are extremely frustrating for the dentist and can certainly be detrimental to the health of the patient.

Laser dentistry is a case in point. While a lot of good scientific research has been undertaken in this area, many of the clinical uses of laser technology being advocated today are based on anecdotal reports. In effect, the clinical use of lasers, in some instances at least, has gone ahead of the appropriate scientific support which should be present. This is inappropriate. As dental professionals we must base our clinical applications on solid scientific findings. We want to do the best we can for our patients. Given this fact, the treatment modalities we utilize should be consistently effective, and consistently safe for both the patient and the dental team.

The intent of this article is not to present a comprehensive review of the use of lasers in dentistry, but to discuss, and cover examples of, the nature of the scientific investigation which has been done, and still needs to be done, to provide the comprehensive scientific foundation that should underlie the use of lasers in dentistry. Lasers do have the potential to make a significant impact on the practise of dentistry, however, in hard and soft tissue applications, both of which will be considered in this discussion.

Scanning Electron Microscopy

The scanning electron microscope (SEM) is a valuable research instrument in its

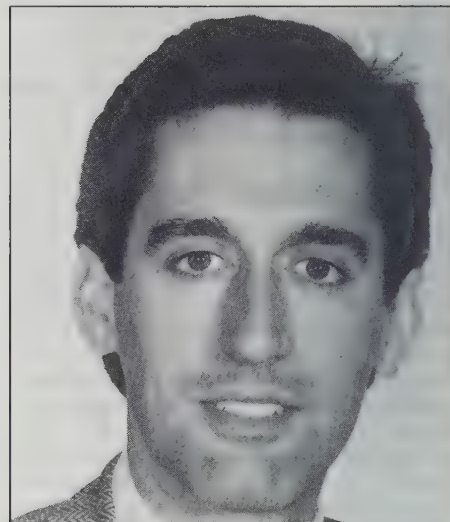


Dr. Kenneth L. Zakariasen

own right, but it is particularly useful to researchers investigating the effects of lasers on dental hard tissues and materials. For example, the authors initial investigations into the potential for laser applications in endodontics centred on the effects of laser irradiation on the root-canal wall.^{1,2,3} We determined, using scanning electron microscopy, that lasers could melt dentin and potentially seal dentinal tubules. Further research utilizing the SEM showed that apical plugs of enamel particles could be fused across the apical canal area to potentially seal the canal.⁴ This provided the necessary data for the development of an apical obturation technique, which could then be tested by apical leakage studies.⁵

Scanning electron microscopy can also be used to investigate the potential for laser etching as an alternative to acid etching of enamel.⁶ The SEM allows researchers to see the roughened enamel surface that results from either acid etching or laser etching. Comparisons can then be made between the effectiveness of various lasers and exposure parameters so that the best possible laser etching can be obtained.

Many research studies reported in the literature indicate that laser irradiation of enamel can reduce the subsurface demineralization which occurs during the caries process.⁷⁻⁹ It is important, however, that the exposure parameters used for preventive purposes do not lead to a roughened surface, as is observed in laser etching. If such roughening were to occur, we would



Dr. Douglas N. Dederich

be unintentionally creating an enamel surface where plaque could more easily adhere, which would be contrary to what we hoped to achieve through preventive therapy. Fortunately, thanks to the SEM, it is easy to evaluate the enamel surfaces of extracted, laser-treated teeth to ensure that preventive laser exposures will leave the enamel surface smooth.

Should laser preventive therapy prove to be an effective clinical technique, it is certain that restorative materials such as composite resins would occasionally receive some laser irradiation. It is currently not known whether exposure to preventive laser irradiation would have detrimental effects on these materials. Scanning electron microscopy could be used as an indicator of whether dental restorations would be damaged by laser therapy.

In light of its obvious usefulness, the scanning electron microscope will undoubtedly continue to be utilized extensively in future research relative to the use of lasers in dentistry. It is a relatively rapid and cost effective way to obtain significant qualitative information regarding the effect of laser radiation on dental hard tissues and restorative materials.

Measurement of Thermal Changes

When light impinges on biological tissue, four things may occur: 1) reflection or back-scattering on the tissue surface, which directs the light energy away from

the tissue; 2) scattering within the tissue, which distributes the light to portions of the tissue not lying directly in what otherwise would be the path of the beam; 3) absorption of the light energy within the tissue, which results in a temperature rise; or 4) the transmission of the light energy through the tissue to whatever lies beyond.

With the laser wavelengths now being used clinically and in dental research, reflection from the tissue surface has not yet been shown to be a major clinical concern, except where it has resulted in a decrease in the energy available for direct interaction with the target tissue.

The amount of scattering that occurs when laser energy is directed at a tissue depends to a large degree on the absorption of that particular wavelength of light in that particular tissue. For our purposes, it is paramount to understand that the wavelength, or frequency, of the laser beam determines the degree to which its energy is absorbed.¹⁰ For example, two laser wavelengths currently marketed for dental use are 10.6 micrometres (μm) (CO_2) and 1.06 μm (Nd-YAG). The CO_2 (carbon dioxide) laser is much more efficiently absorbed in biological substances such as water and organic material, resulting in a very shallow depth of penetration (less than 0.1 millimetre (mm)) with very little concomitant scattering. The Neodymium-Yttrium-Aluminium-Garnet, or Nd-YAG, laser will travel approximately 60 mm in water, losing 90 per cent of its initial energy in the process. It is usually absorbed more in organic tissue components, but penetration varies between types of tissues. This low degree of Nd-YAG laser-energy absorption is accompanied by a large degree of scattering, and results in the energy being distributed over a much larger volume of tissue than is the case when CO_2 laser energy is used. In soft tissue, this penetration can occur from depths of 1 mm to 3 mm or more.¹¹ In dentin, the absorption of Nd-YAG laser energy changes relative to variations in the optical properties within dentin, resulting in unreliable effects.^{1,2}

Absorption of the laser energy usually occurs after a certain amount of scattering, at which time it is converted from light energy to heat energy. This causes a rise in temperature,¹⁰⁻¹⁵ which is the main effect of the surgical lasers now used to cut or ablate tissue. Other, more complicated, effects are possible when these lasers are pulsed, that is, made to produce short, extremely powerful (thousands to millions of watts of energy at peak power) pulses of laser energy. Two pulsed Nd-YAG lasers are currently being marketed for dental use, making it all the more important to

understand what happens when high-powered laser energy strikes our patients' oral tissues.

If the tissue in question has boundaries or interfaces with other tissues, one must consider whether any of the laser energy could travel beyond this border, and, if so, what the effects of this transmission would be. For example, the pulsed Nd-YAG laser has been advocated for use within the root canal. A legitimate scientific concern, which remains unsatisfied, relates to the safety of the periapical tissues, since the wavelength of light produced by this system is easily transmitted through the sclerotic dentin commonly found in the apical portion of the root.^{1,2} Similarly, a model¹⁶ has been proposed which indicates that during irradiation of the coronal dentin or enamel, the dentinal tubules may act as "waveguides," or structures capable of directing the laser's energy. As a result, the beam of a penetrating laser, such as the Nd-YAG, would be concentrated and brought directly to the pulpal-dentin interface. The long-term effect of these types of treatments has not been determined by controlled clinical trials.

Since absorption results in increasing temperatures, the process of heat conduction must also be precisely determined before any laser application can be recommended. The amount of heat produced during laser treatment is controlled by several factors. These include the laser's power, its wavelength, and the duration of exposure. Furthermore, the duration of exposure affects how far the heat produced will be conducted. Since heat conduction requires time,¹⁷ the shorter the pulse used the less the depth of heat penetration will be, assuming the laser's energy is absorbed on the surface of the target tissue. However, these wide exposure parameters can result in an almost infinite number of possible degrees of tissue effects, and must therefore be cut down to a manageable number. Research is gravely needed into which combinations of laser-exposure parameters are required to assure optimal treatment benefits for our patients.

To solve this cumbersome problem, computers have been used to numerically model the heat transfer and stresses that occur in tissue upon laser irradiation.¹⁸ Although computer models must be interpreted carefully (they have been known to offer very precise wrong answers) and compared to experimental data for validation, they offer great promise. In the future, they could allow us to accurately predict the effects of new laser wavelengths and exposure regimens on all dental tissues.

While computer models are being devel-

oped to accurately predict heat production and distribution characteristics in dental tissues treated with various laser wavelengths and exposure parameters, it is also possible to collect experimental data using thermistors. These devices have proved to be very useful for ascertaining whether heat production will be a problem with a particular laser or set of exposure parameters.

Studies conducted by the authors in this area¹⁹ have investigated the temperature elevations that occur across various thicknesses of dentin when a surface is subjected to single- and multiple-pulse laser energy at exposure parameters sufficient for either preventive therapy or laser etching. The results of this research indicate that CO_2 laser preventive and etching therapies can potentially be accomplished without heat damage to the dental pulp, providing the appropriate exposure parameters are utilized. It should be pointed out, however, that subjecting dental hard tissues to laser energy at exposure parameters in excess of those ultimately recommended will greatly increase the potential for heat damage to both the pulp and the periodontal structures. Laser procedures in dentistry must therefore be considered as a very technique-sensitive group of procedures.

Bonding Studies

Bonding studies are used to assess the strength of the bond between restorative materials and tooth structure, i.e. enamel and dentin. Given that the retention of many restorations now depends heavily on the bond created between acid-etched enamel and the restorative material employed, it is essential that the appropriate enamel surface be consistently and effectively etched. Very preliminary research has indicated that laser etching of enamel may be as good as, or superior to, acid etching in terms of developing a roughened surface.²⁰ There may also be advantages inherent in laser etching with regard to the controllability and rapidity of the process as compared to acid etching. Despite the superior appearance of laser-etched enamel surfaces on SEM photos, however, bonding studies must be performed. It is essential to compare the strength of similar bonds between restorative materials and both laser-etched and acid-etched enamel surfaces.

Researchers have also investigated the possible enhancement of latest-generation dentinal bonding resins with laser energy, and the results have been promising.²¹⁻²³ Conceivably, the technique could allow the placement of composite restorations with

less dependence on retentive cavity form and less removal of sound tooth structure. However, the encouraging *in vitro* results that have been obtained must be followed with animal studies to evaluate the thermal risk to the pulp and the efficacy of the treatment. Finally, controlled clinical studies are necessary to determine whether a real clinical benefit exists.

Artificial Caries System

As mentioned in the section on scanning electron microscopy, it has been reported that laser irradiation of enamel can lead to the inhibition of the subsurface demineralization of enamel. One important way to study this phenomenon is through the use of an artificial caries system. This involves placing enamel from non-carious extracted teeth in special acidic solutions, causing demineralization patterns very close to those seen for *in vivo* carious lesions. In effect, then, carious lesions can be initiated in an *in vitro* rather than *in vivo* environment, which greatly facilitates the study of various preventive measures.

With regard to testing the efficacy of laser-based preventive treatment, laser-irradiated and non-laser irradiated sections of enamel on the same enamel surface can be exposed to the artificial caries solution, hard tissue sections can be prepared, and subsurface demineralization patterns can be analyzed and compared.⁸ The artificial caries system provides a very effective means of comparing the demineralization inhibition properties of various laser wavelengths as well as the effectiveness of various sets of exposure parameters.

Microbiological Studies

The application of CO₂ and Nd-YAG lasers to endodontics has led to considerations of the efficacy of these lasers in sterilizing the canal. To date, only the CO₂ laser has been shown to have 100 per cent lethality for sterilization purposes.^{24,25} Since the ability of this laser to kill bacteria upon direct irradiation has been demonstrated, it is now necessary to determine the minimal exposures required to sterilize clinically, and whether these exposures pose a clinically significant thermal risk to adjacent tissues.

Animal Studies

The CO₂ laser's ability to kill bacteria and seal off small blood vessels has led to speculation on its usefulness for treating pulpal exposures, which may occur during routine operative procedures. In theory, sterilizing the pulpal tissue within an exposure site, as well as the surrounding dentin, may increase the success rate of

pulp capping procedures. This hypothesis requires testing in animal models, where the benefits of laser treatment of the pulp cap, if any, could be compared with the results seen in non-irradiated (i.e. control) pulp caps. Such a study is now being undertaken by the authors; however, this procedure needs to be investigated further. Animal studies are also required to explore other potential endodontic applications of the laser. These could include fusing the apical plugs to enhance the seal from within the root-canal, removing tissue remnants, and decreasing the permeability of the root-canal wall.

In periodontics, much more research is required before lasers can be recommended for any use other than minor soft tissue surgery, which is the only dental use of lasers currently approved by the United States Food and Drug Administration (for CO₂ and Nd-YAG lasers only). We need to know more about the safety and efficacy of using these lasers inside of a periodontal pocket. In the case of the penetrating Nd-YAG laser, intra-pocket laser exposure will irradiate the cementum and dentin of the root surface, the periodontal ligament, the connective tissue of the pocket wall, and the bone. Little or no research has been done on the effects of Nd-YAG laser energy on all of these tissues.

Another controversial area, which has enjoyed a good deal of research attention since the mid-1960s, is wound-healing enhancement and pain alleviation. Typically, these phenomena are associated with the helium-neon (He-Ne) and Gallium Arsenide (GaAs) lasers. (Some animal studies have shown positive results,²⁶⁻²⁸ but others have not.²⁹⁻³¹)

The mechanisms of low-power laser interaction with tissue have been investigated and shown to create cellular and physiologic changes.³² Since the power levels needed to induce these effects are so low (3-15 milliwatts), there is little need for concern about thermal damage to tissue. The question of efficacy then becomes central, and it is here that more research is needed before clinical benefits can be confidently predicted.

Before any laser can be advocated for human clinical studies of these and other periodontal uses, however, animal studies are required to better define the desired clinical end points of therapy, to determine *in-vivo* efficacy, and to refine the treatment technique.

Clinical Trials

A considerable amount of *in vitro* and animal research on the use of lasers for

such things as prevention, bonding and endodontic procedures is still required. Such research is rapidly progressing and, in the foreseeable future, human clinical trials will be possible.

Clinical trials are really the definitive tests of new treatment modalities. For example, the use of artificial caries data may indicate that laser irradiation can inhibit subsurface demineralization of enamel. However, when applied as a preventive therapy to patients, will it in fact result in a reduced incidence of caries? With regard to bonding, scanning electron microscopy and bond-strength studies may indicate that laser etching is more effective than acid etching for composite bonding. In clinical trials research, long-term retention of bonded restorations and their marginal integrity can be studied in a real life situation. In endodontics, will the apparent advantages of lasers for apical sealability and canal sterilization translate into higher clinical success rates, fewer microbiologic complications, and/or more rapid, comfortable endodontic treatment procedures? Only clinical trials based on these questions can provide definitive answers.

The use of lasers in periodontics has been restricted in the United States by the Food and Drug Administration. To date, they can only be used for soft-tissue pocket reduction procedures, such as gingivoplasty and gingivectomy. These types of procedures have been described in the literature.³³ Using any laser within a periodontal pocket raises a number of concerns not yet addressed in good human clinical investigations. For example, the use of the Nd-YAG laser on bone is considered to be contraindicated by recent research.³⁴ Even though claims abound, it has not yet been scientifically determined that intra-pocket laser use offers any long-term clinical benefit over scaling and root planing alone.

The laser has not been proved effective for removing calculus and debris from the pocket in such a way as to make traditional methods unnecessary, or even to offer any additional benefit. Laser curettage remains a questionable procedure when compared to scaling and root planing alone.^{35,36} Furthermore, the long-term effect on the pulp of using a laser within the periodontal pocket has not yet been determined. In fact, theoretical considerations point to the need for great caution.¹⁶ Much the same thing can be said about the effect of laser irradiation on the collagen of the root surface and its ability to participate in connective tissue reattachment. The ability of low-power lasers to enhance bone growth in guided-tissue regeneration techniques is also still uninvestigated.

In humans, the enhanced healing of cervical erosions³⁷ and a variety of skin ulcers³⁸⁻⁴⁰ by laser irradiation has been reported. However, well-controlled clinical studies in the dental arena have yet to investigate these phenomena and their possible clinical relevance.

From all of the above, it should be very clear that more clinical laser research is needed on many fronts before the full potential of the laser can be realized in our dental armamentarium.

Summary

We have attempted to accomplish two purposes in this article. First, we have presented the case that extensive scientific investigation must form the base of our profession, that it must be an ongoing, continuous process and that laser dentistry must be developed through extensive scientific inquiry — as all of our treatment modalities should be. Second, we have presented many examples of the science involved in the development of laser dentistry. Lasers do have far-reaching potential for application to dentistry. We, as a profession, must insist that such laser development is done properly, not foisted upon us based on anecdotal reports and incomplete research.

References

1. Dederich, D.N., Zakariasen, K.L., and Tulip, J. Scanning electron microscopic analysis of canal wall dentin following neodymium-yttrium-aluminum-garnet laser irradiation. *J Endo* 10(9):428-431, 1984.
2. Dederich, D.N., Zakariasen, K.L., and Tulip, J. An *In-Vitro* Quantitative Analysis of Changes in Root Canal Wall Dentin Due to Pulsed Neodymium-Yttrium-Aluminum-Garnet Laser Irradiation. *Lasers in the Life Sciences* 2(1):39-51, 1988.
3. Dederich, D., Zakariasen, K., Tulip, J. An *In-Vitro* Quantitative Analysis of the Effects of Continuous-Wave Carbon Dioxide Laser Irradiation on Root Canal Wall Dentin. *Lasers in the Life Sciences* Vol. 2, No. 1, 1988.
4. McMurray, M., Zakariasen, K., Patterson, S., Dederich, D., and Tulip, J. Comparison of CO₂ Laser-Fused Dentin and Enamel Root Canal Plugs. *J Dent Res*, Programs and Abstracts of Papers Vol. 65, March 1986.
5. Zakariasen, K., et al. Apical Leakage Associated with Lased and Unlased Plugs, *J Dent Res*, Abstract #752, March 1986.
6. MacDonald, R., Zakariasen, K., Peters, J., and Best, S. Comparison of Lased and Acid Etched Enamel Using Scanning Electron Microscopy. *J Dent Res* Vol. 69, March 1990.
7. Nelson, D., et al. Effect of Pulsed Low Energy Infrared Laser Irradiation on Artificial Caries-Like Lesion Formation. *Caries Res* 20:289-299, 1986.
8. Boran, T.L. and Zakariasen, K.L. The Effect of Low-Level CO₂ Laser Radiation on the Inhibition of Smooth Surface Caries (*In Vitro* Study). *Proc. of Laser Surgery: Advanced Characterization, Therapeutics, and Systems II*, SPIE 1200:403-407, 1990.

9. Peters, J., Zakariasen, K., Boran, T., and Barron, J. Effects of Pulsed/Nonpulsed CO₂ Laser Energy on Enamel Demineralization. *J Dent Res* Vol. 69, March 1990.
10. Polanyi, T.G. Laser Physics. *Otolaryngol Clin North Am* 16(4):753-774, 1983.
11. Halldorsson, T., and Langerholc, J. Thermodynamic analysis of laser irradiation of biological tissue. *Appl Opt* 17:3948-3958, 1978.
12. Landry, J. Bernier, J.P., and Marceau, N. Comparative evaluation of the mammalian cell thermal sensitivity to pulsed CO₂-laser irradiation and hyperthermic water-bath treatment. *Radiat Res* 71(1):240-250, 1977.
13. Abela, G., Crea, F., Smith, W., Pepine, C.J., and Conti, C.R. *In vitro* effects of argon laser radiation on blood: Quantitative and morphologic analysis. *JACC* 5(2):231-237, 1985.
14. Ready, J.F. Effects of high power laser radiation, Academic, New York, 67-87, 1971.
15. Hallsworth, R.S. and Isenor, N.R. Vibrational relaxation of CO₂-laser excited SiF₄ gas in binary mixtures. *Chem Phys Lett* 22:283-286, 1973.
16. Altshuler, G.B., Grisimov, V.N., Ermolaev, V.S., and Vityaz, I.V. The Human Tooth as an Optical Device, SPIE: The International Society of Optical Engineering, Proceedings: OElase'91, Lasers in Dentistry Section.
17. Carslaw, H.S., Jaeger, J.C. Conduction of heat in solids. 2nd ed. Oxford University Press, London, 75, 1959.
18. Cummins, L., and Navenberg, M. Thermal effects of laser radiation on biological tissue. *Biophys J* 42(1):99-102, 1983.
19. Zakariasen, K., Barron, J., and Boran, T. Temperature Changes Across CO₂ Lased Dentin During Multiple Exposures, *Laser Surgery: Advanced Characterization, Therapeutics, and Systems II*. Stephen N. Joffe, M.D., Kazuhiko Atsumi, M.D., Editors. *Proc. SPIE* 1200:397-402, 1990.
20. MacDonald, R., Zakariasen, K., Peters, J., and Best, S. Comparison of Lased and Acid Etched Enamel Using Scanning Electron Microscopy. *J Dent Res* Vol. 69, March 1990.
21. Cooper, L.F., Myers, M.L., Nelson, D.A., Mowery, A.S. Shear strength of composite bonded to laser pretreated dentin. *J Prost Dent* 60(1):45-49, 1988.
22. Dederich, D.N., Hinkelman, K.W., Albert, A., and Tulip, J. Effects of Carbon Dioxide Laser on Dental Bonding. *J Dent Res* 68(10):868, 1989.
23. White, J.M., Goodis, H.E., Rose, C.M., Khosrovi, P.M., and Hornberger, B. Shear bond strength of Nd-YAG laser treated dentin. *J Dent Res* 70(4):397, 1991.
24. Zakariasen, K.L., Dederich, D.N., Tulip, J., DeCoste, S., Jensen, S., and Pickard, M. Bactericidal action of carbon dioxide laser radiation in experimental dental root canals. *Can J Microbiol* 32(12):942-946, 1986.
25. Dederich, D.N., Pickard, M.A., Vaughn, A., Tulip, J., and Zakariasen, K. Comparative Bactericidal Exposures for Selected Oral Bacteria Using Carbon Dioxide Laser Radiation. *Lasers Surg Med* 10:591-594, 1990.
26. Kana, J., Hutschenreiter, G., Haina, E., and Waidelich, W. Effect of low-power density laser radiation on healing of open skin wounds in rats. *Arch Surg* 116:293-296, 1981.
27. Ribari, O. The stimulating effect of low power rays: experimental examinations in otorhinolaryngology. *Rev Laryngol Otol Rhinol (Bord)* 102: 531-533, 1981.
28. Surinchak, J., Alago, M., Bellamy, B., Stuck, B. and Belkin, M. Effects of low-level energy lasers

on the healing of full thickness skin defects. *Lasers Surg Med* 2:267-274, 1983.

29. Hunter, J., Leonard, L., Wilson, R., Snider, G., and Dixon, J. Effects of low energy laser on wound healing in a porcine model. *Lasers Surg Med* 3(4):285-290, 1984.
30. Anneroth, G., Hall, G., Ryden, H., and Zetterqvist, L. The effect of low-energy infrared laser radiation on wound healing in rats. *Br J Oral Maxillofac Surg* 28(1):12-17, 1988.
31. Colver, G. and Priestly, G.C. Failure of a helium-neon laser to affect components of wound healing *in vitro*. *Br J Dermatol* 12(2):179-188, 1989.
32. Basford, J.R. Low energy laser treatment of pain and wounds: Hype, Hope, or Hokum? Editorial, *Mayo Clin Proc* 61:671-675, 1986.
33. Pick, R., Pecaro, B.C., Silberman, C.J. The laser gingivectomy. The use of the CO₂ laser for the removal of phenytoin hyperplasia. *J Periodontol* 56(8):492-496, 1985.
34. Latif, M., Kugel, G., Chapman, R., Norris, L., Kabani, S., and Washburn, B. Nd:YAG laser and conventional techniques in bone surgery. *J Dent Res* 70(4):519-527, 1991.
35. Ainslie, P. and Caffesse, R. A biometric evaluation of gingival curettage (II). *Quintessence Int* 9(5):519-527, 1981.
36. Echeverra, J. and Caffesse, R. Effects of gingival curettage when performed one month after root instrumentation. *J Clin Periodontol* 10(3): 277-286, 1983.
37. Kovacs, L., Varga, L., Palyi, I., Tisza, S., Gundy, S., Unger, E., and Lapis, P. Experimental investigation of photostimulation effect of low energy He-Ne laser radiation. *Laser Basic Biomed Res* 22:14-16, 1982.
38. Kroetlinger, M. On the use of the laser in acupuncture. *Int J Acupuncture Electrother Res* 5:297-311, 1980.
39. Mester, E., Thoth, N., and Mester, A. The biostimulative effect of laser beam. *Laser Basic Biomed Res* 22:4-7, 1982.
40. Goujon, C., Divol, J., and Moulin, G. Preliminary results of midlaser treatment of chronic ulcerations of the legs (abstract). In: Proceedings of the 6th Congress of the International Society for Laser Surgery and Medicine, 78, 1985.



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Research Feature

Current Research in Diagnostic Methods for Assessing Periodontal Disease and Its Future Impact

Walter J. Loesche, D.M.D., Ph.D.

Introduction

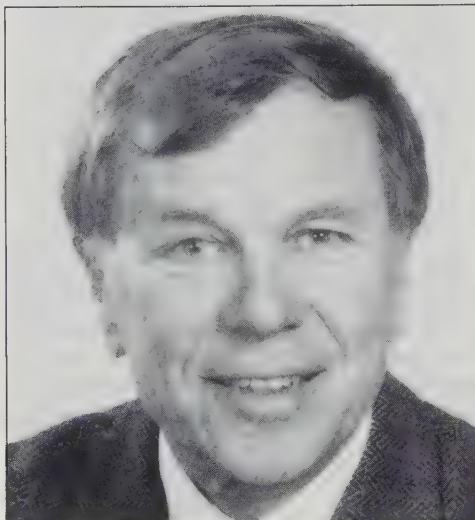
The loss of teeth due to periodontal disease is not inevitable, nor is the process, once begun, a simple linear progression from gingivitis to periodontitis to tooth loss. Data acquired in recent years indicate that periodontal disease is essentially an infection, but that only a finite number of the estimated 200 to 300 bacterial species that can be isolated from the periodontal plaque play a contributing role. This data, while circumstantial, is compelling. The challenge to the research community is therefore to identify these putative periodontal pathogens, develop simple means of identifying patients or sites infected with these organisms, elucidate the pathogenic mechanisms and, ultimately, provide treatment modalities that are either preventive or therapeutic.

This essay will be concerned primarily with the evaluation of diagnostic tests that will identify patients and/or sites infected with these organisms, but will also describe diagnostic procedures aimed at quantifying inflammation and morbidity. It is assumed that these diagnostic markers will provide an unequivocal basis for instituting some form of treatment that is safe, effective, and reasonably inexpensive.

Diagnostic Methods

There are three components of the periodontal ecosystem that can be examined for diagnostic purposes: the hard tissue comprising the teeth and bone, the soft tissue, and the plaque. The visual inspection of the teeth for excessive plaque accumulation and calculus, and of the soft tissue for redness, edema, and bleeding has been the traditional method for recognizing periodontal disease. Periodontal probing and radiographs have been used to document the degree of morbidity and to provide the clinical basis for different treatment procedures. Newer diagnostic procedures would have to either build upon these established procedures or complement them, because it is unlikely that they will replace them.

Two of the procedures to be described, the electronic periodontal probe and subtraction radiography, are logical extensions of existing procedures and could be incorporated immediately, although with a



Dr. Walter J. Loesche

financial cost, into almost any dental practice. The diagnosis of a bacterial infection is a newer concept, and acceptance of any microbiologically-based procedure may require, in some cases, a reeducation of the practising dentist. The diagnosis of an inflammation may be easier for the clinician to accept, as he has been taught to recognize inflammation and to "read" the tissue response as a means of judging the adequacy of treatment.

Only a few of these new diagnostic procedures will make it to the marketplace because of the cost of meeting safety and efficacy requirements of agencies such as the American Food and Drug Administration (FDA). Thus, a commercial sponsor is needed who is willing to invest in multi-centre clinical trials to demonstrate the accuracy and reliability of the procedures and to perform the necessary stability and safety studies. Some diagnostic procedures, such as those which use a radio-nucleotide assay, can only be performed in a reference laboratory, whereas other procedures can be adapted for chairside use in the dental office (Table 1). There also needs to be a dental community willing to use these devices and procedures.

Hard-Tissue Based Procedures

1. Constant Pressure Periodontal Probes.

The periodontal probe has been used to document periodontal morbidity (by probing depths and attachment levels). The

measurements so obtained have a large method error, plus or minus one millimetre, and the recording is time consuming, error prone, and does not lend itself to easy comparisons of data obtained at different visits. Remarkable technical improvements have been achieved in all of these areas with the development of electronic periodontal probes that use a constant probing pressure, notably the Toronto probe, the Inter-Probe, and the Florida probe.²⁻⁴

Each of these electronic probes is mated to computer software that can automatically record probing depth about the indicated site. When patients are reexamined using the Florida probe, the program will alert the dentist to changes in various sites that are beyond a certain threshold, one millimetre or two millimetres, perhaps, so that he or she will know immediately if improvement or deterioration has occurred.

The Inter-probe and the Florida probe allow the dentist to automatically record bleeding (yes or no) at a site. In addition, the Florida probe allows measurement of attachment levels relative to an accessory disc that is placed on the occlusal surfaces of the teeth. This latter advantage comes with a doubling of the time needed to examine the patient, however, as one pass through the dentition is necessary for measurement of the probing depths, and a second pass is used for determining the attachment levels.

The Toronto probe records the speed at which the probe decelerates when the epithelial junction at the base of the pocket is encountered. This change in velocity may provide insights into the health status at the base of the pocket. If the probe penetrates and slows down gradually inflammation is present, but if it decelerates quickly, then health or healing is indicated.⁵ This would be valuable information to have in order to assess healing following any form of treatment.

2. Subtraction Radiography

Radiographs document bone loss. Serial radiographs taken over several years can be misinterpreted if the angulation of any of the radiographs differs appreciably. Procedures for immobilizing either the patient's head or the X-ray film relative to the X-ray cone have been described, and indeed, these standardized radiographs

improve the informational content of serial radiographs.^{6,7}

It is now possible to digitize a video image of a radiograph and store this information in a computer. A second radiograph taken weeks, months, or years later can be similarly processed. If the second image is then superimposed over the image of the first radiograph, the two radiographs can

be subtracted and a new image produced. In the new image bone loss is visualized as a blackening of an area and bone gain as a whitening of an area. Often, changes that could not be ascertained by normal viewing of both radiographs can be observed and quantitated using this technology.⁶

The crucial variable in this process is the

standardized radiographs. In the past, some of the impression materials used to obtain the initial dental registrations fatigued over time, or were not seated properly in the first place because of patients who moved their teeth or had experienced tooth loss.⁷ Today, the use of a cephalostat, in which the patient's head can be reproducibly positioned, as well as stable impression materials, appears to have solved these problems.⁸

TABLE I

Summary of Performance Sites for Various Periodontal Diagnostic Procedures or Tests

Diagnostic Procedure	Performance Site for Diagnostic Test	
	Office	Reference Lab
Hard tissue		
electronic probes	x	
subtraction radiography	x	
Plaque based		
DNA probes		
radionucleotide market		x
enzyme marker	x	
Immunological reagents		
enzyme marker		x
latex agglutination	x	
Enzymatic		
color change	x	
radionucleotide marker		x
Volatile sulfur compounds	x	
Inflammation		
Temperature	x	
Enzymes		
color change	x	
radionucleotide marker		x
Inflammation mediators		
color change	x	
radionucleotide marker		x

TABLE II

Utilities of a Diagnostic Procedure

Utility	Benefit
Confirmatory	1. Provides an objective measure of periodontal disease 2. Provides documentation for subsequent treatment (medical-legal)
Diagnosis	1. Active process is occurring 2. May identify microbial etiological agent and lead to appropriate choice of antimicrobial agent
Endpoint for treatment	1. Tells when treatment is finished 2. Tells where there are residual problems
Compliance	1. May tell if patient has used medication
Maintenance	1. May identify patients or individual tooth sites prior to clinical signs 2. May identify early events in tissue destruction
Predictive	1. May identify patients or individual tooth sites prior to clinical signs
Identify source of infection	1. Can screen household members for putative pathogens

Plaque-Based Procedures

Much of the excitement concerning the need for diagnostic tests is based on evidence which suggests that many forms of periodontal disease are specific bacterial infections. These diseases, in theory at least, are therefore treatable infections, assuming the right antimicrobial agent(s) is/are available and used.⁹ What is desired, then, are diagnostic tests for these infections that are less costly and quicker than the quantitative anaerobic culturing methods and identification procedures that have been used in the research laboratory to implicate these organisms as putative periodontal pathogens.

However, the antibodies, DNA probes, and enzyme diagnostic markers that are currently being developed are directed toward a limited number of the cultivable organisms in the plaque, and these organisms may or may not be the etiologic agent(s) of periodontal disease. Thus, it is necessary for the sponsor of such diagnostic tests to show that their test not only recognizes the sought-after organism in the plaque, but that this information provides some advantage or benefit to the clinician in terms of treating and managing the patient's periodontal condition.

1. DNA Probes

The DNA fingerprinting technique, made popular because of its usage in forensic medicine and in establishing paternity, has applications in clinical dentistry as well. This technique was developed in bacterial systems and can be used for the precise identification of bacterial species within any type of sample.

BioTechnica Diagnostics of Cambridge, Massachusetts, and Micro Probe Diagnostics of Seattle, Washington, have developed probes to many of the putative periodontal pathogens. Each has chosen a different methodological approach, which has led to different marketing tactics and regulatory hurdles. BioTechnica has prepared whole genomic 32p probes to *Porphyromonas* (formerly *Bacteroides*) *gingivalis*, *Prevotella* (formerly *Bacteroides*) *intermedius*, *Hemophilus* (formerly *Actinobacillus*) *actinomycetemcomitans*

and *Treponema denticola*.¹⁰ The 32p reporter molecule requires that the samples be processed in a laboratory approved for the use of high-energy radio-nucleotides, and BioTechnica has established such a reference laboratory.

Many of the FDA guidelines related to the validation of diagnostic tests do not apply when a reference laboratory is being used, and when there is no interstate sale of a DNA probe. This has allowed BioTechnica to enter the marketplace prior to any of its competitors and to utilize a protocol in which the clinicians collect the samples and send them via the mail to the reference laboratory. Once there, they are processed, and a report is returned to the clinician within one to two weeks. Unfortunately, the DNA probes are somewhat expensive, which could limit the number of samples that the average clinician will submit for analysis.

Micro Probe has developed oligonucleotide probes that use an enzymatic reporter system.¹¹ Because of the nonradioactive nature of these probes, they can be handled in any type of laboratory setting or even in the dental office, provided that special equipment is available. Such equipment has been developed, and while ingenious in its simplicity of operation and design, it carries a high initial cost, about \$4,000 to \$6,000. Also, because the equipment and reagents are sold across state lines, the Micro Probe System must meet the applicable FDA guidelines. It allows clinicians to process their own samples with a short turn-around time, however, which should appeal to many of them.

Do the DNA probes work? In theory, they should be the ultimate determinant of whether an organism is present in the plaque sample. In one study, *P. gingivalis*, *A. actinomycetemcomitans* and *P. intermedium* were more readily detected in plaque samples by whole genomic DNA probes than they were by standard culturing procedures.¹² We have confirmed these findings in our own study, which, in addition, determined that these organisms are generally also easier to detect in plaque samples through the use of highly-specific antibodies than they are using culturing procedures.¹³ This indicates that a bacteriological diagnosis can be uncoupled from the restraints and costs associated with an anaerobic cultural methodology.

2. Immunological Reagents

As mentioned in the previous section, antibodies can also uniquely recognize bacterial species. Various laboratories have reported on the successful usage of highly-specific polyclonal (made from many types of antibody-forming cells) and monoclonal

(made from only a single type of antibody-forming cell) antibodies to detect various putative periodontal pathogens in plaque samples.^{14,15} As with the DNA probes, these antibodies require that some type of reporter molecule be attached to the antibody to permit its detection and quantitation in a sample such as plaque. This can be a fluorescent dye that is either directly attached to the original antibody molecule (the direct fluorescent antibody test) or bound to a second antibody molecule that recognizes the original antibody (the indirect fluorescent antibody test). The same enzyme-linked reporter systems described for the DNA probes can also be used.

The problem with antibody assays is the lack of standardization of the antibodies. The antibodies made by one laboratory or supplier may not behave like those developed by another supplier. In this regard, the 3M Company has prepared a panel of monoclonal antibodies to *P. gingivalis*, *T. denticola*, and *A. actinomycetemcomitans*, among others. These antibodies are being marketed to research groups after in-house evaluation for specificity (to eliminate all cross-reactions with other bacterial types). Presumably, these reagents would eventually be available for diagnostic purposes in a reference laboratory setting.

3. Enzymatic Reactions

The bacterial species most frequently associated with periodontitis are gram-negative organisms that, with the exception of *A. actinomycetemcomitans*, can use proteins and peptides as nutrients. One such enzyme, a peptidase capable of hydrolyzing N-benzoyl-DL-arginine-2-naphthylamide (BANA), a synthetic trypsin substrate, has been shown to be possessed by *B. gingivalis*, *T. denticola* (a spirochete) and *B. forsythus*, but not by about 55 other plaque species.¹⁶

Clinical studies have shown that subgingival plaques from some sites hydrolyzed BANA and that this hydrolytic activity was significantly associated with high proportions and numbers of spirochetes and with *P. gingivalis*.¹⁷ Most BANA-positive plaques were from sites with probing depth and attachment loss greater than four millimetres. These findings enabled us to find a sponsor, Oral-B Laboratories of Redwood City, California, for the commercial development of a diagnostic test (PerioScan™) based upon BANA hydrolysis as a marker for an anaerobic infection.

The format of the BANA test was changed from a liquid assay that required overnight incubation to a solid-state assay that could be read at chairside after five to 15 minutes of incubation. A multicentre

study, in which the specificity and the sensitivity of the BANA hydrolysis was compared to the detection of *T. denticola* and *P. gingivalis* by highly-specific polyclonal antibodies in an enzyme-linked immunosorbent assay (ELISA),¹⁸ was performed using the new format. Ninety per cent of the plaques that were BANA-positive had detectable *P. gingivalis* or *T. denticola*, whereas 67 per cent of the plaques that were BANA-negative did not have these organisms.

We were interested in how the BANA test would compare with the DNA probes and/or the immunological reagents. Two hundred and four subgingival plaque samples were collected from diseased sites and processed by all three diagnostic methods for the presence of *P. gingivalis*, *T. denticola* and *P. forsythus*. The PerioScan format of the BANA test was positive in 90 per cent of the plaques in which the DNA probes and antibodies were positive.¹⁹ These findings indicated that, if *P. gingivalis*, *T. denticola*, and *B. forsythus* are appropriate marker organisms for an anaerobic periodontal infection, then the three detection methods are equally accurate in their ability to diagnose this infection. Determining which of these diagnostic procedures to use is, then, a question of cost, convenience, and simplicity of performance.

4. Volatile Sulphur Production

The proteolytic organisms associated with periodontal disease produce an array of end products, some of which, notably hydrogen sulfide (H₂S) and mercaptans, can be measured in the airspace over the tongue. J. Tonzetich of Vancouver has suggested that such measurements have diagnostic value in periodontal disease.²⁰ These volatile sulphur compounds manifest as oral malodors, which often bring a patient to the dentist seeking treatment. (The periodontal department at the University of Toronto has established a malodor clinic to treat patients presenting with the problem. Very often, the malodor can be traced to a periodontal condition, and reduction in the malodor follows from the appropriate periodontal treatment.)

This scenario suggests that malodor can be used as a diagnostic procedure, especially as the volatile H₂S and mercaptans can be easily quantitated at chairside. The procedure consists of the patient closing his mouth for one to two minutes. Then, the operator inserts a straw — connected to a battery-operated pump — over the patient's tongue to draw off the retained air through a sulphur detector (Interscan device). If sulphur-containing compounds are present, an analogue gauge on the

detector reads the amount in parts per million. In many cases where the response has been positive, the BANA test has been used to localize the teeth that could be contributing to the volatile sulphur production.

Inflammation-Based Procedures

Periodontal inflammation brings a variety of cell types to the inflamed site and causes measurable changes in tissue biochemistry. It should, therefore, be reasonable to assume that an overflow of these inflammatory cells and mediators, or tissue breakdown products, would be found in the gingival crevicular fluid (GCF). Several procedures for detecting inflammation have been based upon the detection of inflammatory cells and products in the GCF. In the following discussion, products which have commercial backing will be described, as these are the ones likely to be brought to the attention of the clinician in the foreseeable future.

1. Temperature

An inflammatory process brings an increased blood flow to the site, and this, combined with an increased metabolic activity, raises the temperature in the area. A thermometer with the physical dimensions of a conventional periodontal probe has been developed that can be inserted into a pocket and provide, within one to two seconds, a temperature reading for that site. Subject-to-subject variations in body temperature make it necessary to express the site temperatures relative to the temperature measured simultaneously in the sublingual area, however. A tooth-by-tooth analysis showed that diseased teeth had significantly higher temperatures — in the 0.65°C range — than did anatomically equivalent healthy teeth.

2. Enzymes

When inflammation is present, the levels of certain enzymes will increase either as a result of their being released by cell death or through their association with newly arriving inflammatory cells. One such enzyme, aspartate amino transferase (AST) (also known as serum glutamine-oxalate trans-aminase (SGOT)), is known to be released after cell death. Therefore, its levels in the serum have been used to assess the extent of tissue destruction associated with myocardial infarction and hepatic disease. This enzyme can be detected in the GCF, and its levels have been associated with gingival inflammation in patients with recurrent periodontal destruction.²² Increased levels of collagenases²³ and beta-glucuronidases²⁴

from polymorphonuclear leukocytes (PMNL) can also be associated with periodontal disease.

These enzymes, which have been suggested as potential markers for disease-active sites, can be detected in the GCF. This is usually done by placing a filter paper strip at the orifice of the sulcus after carefully isolating and air drying the area to be sampled.²² The procedure appears to be technique sensitive, as the method of collection of the GCF can profoundly influence the findings.²⁵

Some of the problems associated with the collection of the GCF can be overcome if the sought-after enzyme can be found in the saliva or in used mouth rinse. For example, elevations in the levels of active and latent collagenase derived from PMNL can be detected in a 3-ml mouth rinse to which ¹⁴C glycine-labelled collagen has been added.²⁶

It would have to be demonstrated, however, that the sought-after enzyme or other marker could only enter the saliva or mouth rinse via the GCF and is analogous to the measurement of occult blood in the saliva. This collagenase assay cannot be performed in the dental operatory because of the usage of radioactive compounds, and would not show which teeth or sites are involved.

3. Inflammatory Mediators

An inflammatory response in the periodontium is associated with the production of certain metabolites or mediators which can be detected in the tissue and in the GCF. Prostaglandin E₂ (PGE₂) is the best studied of these mediators, and its levels in the tissue and in the GCF increase five- to six-fold when there is clinical disease.²⁷ When the PGE₂ levels from individual tooth sites were pooled to give a single value for the whole mouth, this value predicted, in the majority of cases, which patients would have teeth showing subsequent attachment loss equal to or greater than two millimetres.²⁷

PGE₂ is measured by radioimmunoassay, a laboratory-based procedure. In the cited study,²⁷ GCF samples were collected from one site on each of the teeth present in the dentition, a procedure which would be impractical in most private practices. However, given the sensitivity of the detection methodology, four picograms, and the strong relationship between pooled GCF-PGE₂ levels and clinical disease, a mouth rinse procedure similar to that described previously for collagenase²⁶ could probably be developed. This test could be offered as a diagnostic service by a reference laboratory.

Summary

A diagnostic test should be useful, ideally leading to a choice of treatment(s) that would confer benefits upon the patient. The many uses of diagnostic tests are listed in Table 2, but it should be recognized that no single test can be relied on exclusively. Combinations of various tests, especially those which detect infections and those which detect inflammation, would provide useful information for diagnosing and managing the patient's treatment.

Certainly, any test or procedure can be considered useful if it facilitates the successful treatment of a patient's periodontal condition without a disproportionate increase in the cost to the patient or in his or her discomfort. By these criteria, many of the tests described in this paper are useful. The entry of these tests into clinical practice seems to be only a matter of time; their true usefulness is for the clinician to determine. Δ

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References

1. Listgarten, M.A., Periodontal probing: what does it mean? *J Clin Periodontol* 7:165-176, 1980.
2. Gibbs, C.H., Hirshfeld, J.W., Lee, J.G., et al., Description and clinical evaluation of a new computerized periodontal probe, the Florida probe. *J Clin Periodontol* 15:137-142, 1988.
3. McCulloch, C.A., Birek, P., Hardy, V., Comparison of gingival attachment level measurements with an automated periodontal probe and a pressure-sensitive probe. *J Periodontol Res* 22:348-352, 1987.
4. Goodson, J.M., Kondon, N., Periodontal pocket depth measurements by fiber optic technology. *J Clin Dent* 1:35-38, 1988.
5. Tessier, J.-F., Ellen, R.P., Birek, P., et al., Relationship between periodontal probing velocity and gingival inflammation in humans. *J Dent Res* 70: p. 364, 1991. (Abstract.)
6. Webber, R.L., Ruttiman, U.E., Heaven, T.J., Calibration errors in digital subtraction radiography. *J Periodont Res* 25:268-275, 1990.
7. Schmidt, E.F., Webber, R.L., Ruttiman, U.E., Loesche, W.J., Effect of periodontal therapy on alveolar bone as measured by subtraction radiography. *J Periodontol* 59:633-638, 1988.
8. Jeffcoat, M.K., Reddy, M.S., Webber, R.L., et al., Extraoral control of geometry for digital subtraction radiography. *J Periodontol Res* 22:396-402, 1987.
9. Loesche, W.J., The bacterial etiology of periodontal disease: The specific plaque hypothesis. *Clinical Dentistry* 1987.
10. French, C.K., Savitt, E.D., Simon, S.L., et al., DNA probe detection of periodontal pathogens. *Oral Microbiol Immunol* 1:58-62, 1986.
11. Dix, K., Watanabe, S., McArdle, S., et al., Species-specific oligodeoxynucleotide probes for the identification of periodontal bacteria. *J Clin Microbiol* 28(2):319-23, 1990.
12. Savitt, E.D., Strzempko, M.N., Vaccaro, K.K.,

et al., Comparison of cultural methods and DNA probe analysis for the detection of *Actinobacillus actinomycetemcomitans*, *Bacteroides gingivalis* and *Bacteroides intermedius* in subgingival plaque samples. *J Periodontol* 59:431-438, 1988.

13. Loesche, W.J., Lopatin, D.E., Stoll, J., et al., Comparison of various detection methods for periodontopathic bacteria. Can culturing be considered as the gold standard? *J Clin Microbiol*, In Press.

14. Zambon, J.J., Reynolds, H.S., Chen, P.G., Rapid identification of periodontal pathogens in subgingival dental plaque. Comparison of indirect immunofluorescence microscopy with bacterial culture for the detection of *Bacteroides gingivalis*. *J Periodontol* 56(11 Suppl.):32-40, 1985.

15. Ebersole, J.L., Frey, D.E., Taubman, M.A., et al., Serological identification of oral *Bacteroides* spp. by enzyme-linked immunosorbent assay. *J Clinical Microbiol* 19:639-644, 1984.

16. Loesche, W.J., Bretz, W.A., Kerschensteiner, D., et al., Development of a diagnostic test for anaerobic periodontal infections based on plaque hydrolysis of benzoyl-DL-arginine-naphthylamide. *J Clin Microbiol* 28:1551-1559, 1990.

17. Loesche, W.J., Syed, S.A., Stoll, J., Trypsin-like activity in subgingival plaque: a diagnostic marker for spirochetes and periodontal disease? *J Periodontol* 58:266-273, 1987.

18. Loesche, W.J., Bretz, W.A., Lopatin, D.E., et al., Multicenter clinical evaluation of a chairside method for detecting certain periodontopathic bacteria in periodontal disease. *J Periodont* 61: 189-196, 1990.

19. Loesche, W.J., Lopatin, D.E., Giordano, J., et al., Comparison of BANA test, DNA probes and immunological reagents for their ability to detect anaerobic periodontal infections due to *Porphyromonas gingivalis*, *Treponema denticola* and *Bacteroides forsythus*. *J Clin Microbiol*, In Press.

20. Tonzetich, J., Production and origin of oral malodor: A review of mechanisms and methods of analysis. *J Periodontol* 48:13-20, 1977.

21. Kung, R.T., Ochs, B., Goodson, J.M., Temperature as a periodontal diagnostic. *J Clin Periodontol* 17:557-563, 1990.

22. Persson, G.R., DeRouen, T., Page, R.C., Relationship between levels of aspartate aminotransferase in gingival crevicular fluid and active

tissue destruction in treated periodontitis patients. *J Periodont Res* 25(1): 17-24, 1990.

23. Bowers, J.E., Zahradnik, R.T., Evaluation of a chairside gingival protease test for use in periodontal diagnosis. *J Clin Dent* 1:106-109, 1989.

24. Lamster, I.B., Oshrain, R.L., Harper, D.S., et al., Enzyme activity in crevicular fluid for detection and prediction of clinical attachment loss in patients with chronic adult periodontitis. *J Periodontol* 59:516-523, 1988.

25. Persson, G.R., Page, R., Effect of sampling time and repetition on gingival crevicular fluid and aspartate aminotransferase activity. *J Periodont Res* 25:236-242, 1990.

26. Gangbar, S., Overall, C.M., McCulloch, C.A.G., et al., Identification of polymorphonuclear leukocyte collagenase and gelatinase activities in mouthrinse samples; correlation with periodontal disease activity in adult and juvenile periodontitis. *J Periodont Res* 25:257-267, 1990.

27. Offenbacher, S., Odell, B.M., Van Dyke, T.E., The use of crevicular fluid prostaglandin E2 levels as a predictor of periodontal attachment loss. *J Periodont Res* 21:101-112, 1986.



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Current Research in Operative Materials and Techniques and its Future Impact

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Introduction

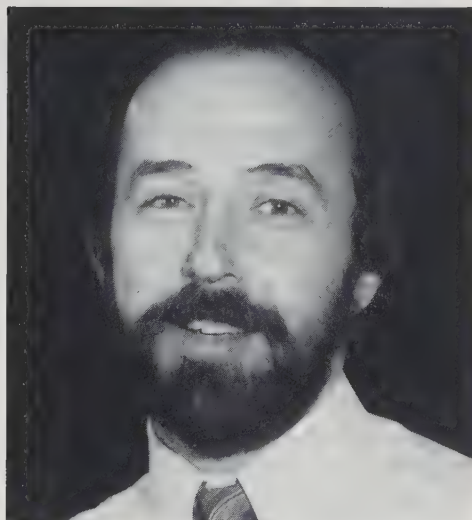
Some recent surveys on the dental health status of adults and school children^{1,2} provide a context for the impact of research on operative dentistry. Although the survey data reflect populations in the United States, an inference of the oral health of Canadians can be made, given the geographic proximity of the two population groups and their life style similarities.

The survey on adults indicated that half the working population had lost no more than a single tooth. Only four per cent of all working adults were completely edentulous. The average number of decayed or restored tooth surfaces per adult was 23, with 95 per cent of these surfaces being in the restored category. Twenty one per cent of employed adults and 63 per cent of adults over the age of 65 presented with root caries. In the five- to 17-year age group, half were caries free. In a previous survey, completed in 1980, only 37 per cent of this group were caries free.

Some of the implications of these data are already known to many practitioners. Most single-tooth restorative dentistry on adults is of the replacement type. Although primary coronal caries will still require treatment, the emphasis in operative dentistry will be on the maintenance of existing restorations and the treatment of root caries. In the United States, it has been estimated that the number of teeth at risk will nearly double from 1972 to 2030.³ Thus, despite the overall decline in caries prevalence, the increasing number of dentulous patients will likely place an increased emphasis on operative dentistry into the next century.

Current research in operative dentistry tends to reflect some of these trends. Major developments are occurring with respect to diagnostic methodologies, materials, and associated techniques. The ability to adhere materials to tooth structure is advancing at a rapid rate. Computers are enabling the development of optical impressions and chairside machining of restorations. These constitute just some of the areas of research currently in progress.

This paper will discuss research activities in the context of the practise of operative



Dr. Ivan Stangel

dentistry into the next century. Although materials and techniques will be emphasized, the spectrum of operative practise will be presented. It is not within the scope of this paper to cover all areas of research with their inherent implications for practice.

Disease Models

The next decade will witness a more biological basis for the management of caries. Historically, operative dentistry has treated caries using a surgical model. This model assumed that all patients presenting with caries are treated equally with respect to diagnosis, plaque control and surgical repair of damage caused by the disease. This has been referred to as symptomatic treatment.⁴

An approach more consistent with a biological model is evolving⁵ and will bring operative dentistry into the 21st century. In this model, caries is regarded as an infection caused by specific plaque organisms. The lesion in the tooth is regarded as the symptom of the disease. Its management will consist of a combination of risk assessment, treatment of the infection (reduction and control of odontopathic organisms) in susceptible individuals as well as the surgical management of carious lesions in teeth. Risk assessment will be made on the basis of biological testing and will include the use of saliva tests, genetic probes and monoclonal antibodies.^{5,6} The willingness by dentists to incorporate some

of these methodologies into their practices has recently been documented.⁷

Adhesion

Basic Research

The adhesion of restorative materials to tooth substrates continues to be a major focus of research activity. Since the bonding of acrylic resin to etched enamel was first described,⁸ attempts have continued at a vigorous pace to decrease the reliance on mechanical retention in cavity preparations. Although this has generally been achieved in the case of bonding to enamel, the long-term *in vivo* adhesion of polymeric materials to dentin has not been adequately demonstrated.

Dentin adhesion can be categorized on the basis of adhesive mechanisms. Although glass ionomer cements develop adhesive bonds to dentin, and thus can be considered a dentin adhesive, the term generally has been used to refer to a group of bi-functional agents that promote the adhesion of composite resins to dentin. Most developmental research concerns this category of adhesive.

Adhesion using polymeric materials is a two-part process consisting of substrate conditioning and the use of functional agents capable of copolymerizing with dimethacrylate resins. Current research is focusing on understanding the basic mechanisms of attachment at each of these levels as well as the evolutionary and novel development of agents for promoting adhesion.⁹⁻¹³

A number of theories have been advanced on the mechanism of the bond to dentin by adhesives. To date, there is no clear evidence to explain the basis for some of the high *in vitro* bond strengths that have been obtained by various investigators.^{10,14,15} The current debate centres on the issue of whether true covalent (chemical) bonds or a microscopic hybrid layer of resin-impregnated dentin are being formed. Clarification of these phenomena is not far away.

Other methods being investigated for improving polymer adhesion include the use of lasers for the pre-treatment of dentin surfaces. Significant increases in bond

strength have been reported for this method.^{16,17}

Clinical Trials

One of the primary clinical uses for dentin adhesion to date has involved the treatment of cervical or root surface lesions. Clinical trials for evaluating their adhesive restoration using dentin bonding agents have varied in duration and outcomes. The confounding results may be explained by the large number of variables that are not standardized between trials. In several studies of two-years duration, loss rates ranged from six to 50 per cent for composite restorations in non-undercut cervical lesions with etched-enamel occlusal margins.¹⁸⁻²⁰ In the study by Wiley *et al*, the loss rate increased from 10 per cent to 42 per cent when enamel was not etched. In a three-year trial, Bastos *et al* reported a restoration loss rate of 30 per cent for non-etched and non-undercut cervical lesions. It was concluded that this was a satisfactory method of restoration.²¹ Van Dijken concluded that none of four dentin bonding systems used in non-enamel etched cervical lesions were satisfactory in a four-year trial.²² It should be noted that in the same study all glass ionomers were retained for the four-year period when dentin was treated with NaOC1 (Sodium Hypochlorite). There is some suggestion that greater emphasis on manipulation variables to counter resin contraction effects would improve retention rates of polymers adhered to dentin.²³

These data suggest that current polymer-based materials are less than optimal for the pure adhesive restoration of teeth. However, they have made it possible to initiate the process of moving away from classic cavity form to one with minimal trauma and minimal removal of healthy tooth structure. Even with the use of macroretention, minimal preparation for cervical lesion restoration is clearly an advantage for patient care.

Research on all aspects of adhesion will ultimately result in a high-strength, durable, dentin adhesive being developed in the not too distant future. An adhesive of this type, not susceptible to hydrolytic degradation and capable of eliminating the contraction gap formation that occurs with the current range of composite resins, will have a profound impact on restorative practice. The need for removal of healthy tooth structure for all aspects of preparation pertaining to retention would be eliminated. Microleakage would be prevented. Furthermore, as the marginal integrity of enamel-bonded composites can be prone to failure as a function of time,²⁴ an effective

dentin adhesive would provide a secondary seal for these restorations.

Light-Cured Liners

Although originally devised as a luting cement and cervical restorative, newer forms of glass ionomers have come to be integrated with composite resins, particularly when cavity margins are located on root surfaces. Thus, glass ionomers have achieved a reasonable degree of notoriety in the past few years. Recently, light-cured forms of the material have been devised and are being investigated. Their adhesive strength to dentin has been shown to be equal to or better than the chemically-cured form.^{25,26} In addition, light-cured liners demonstrate good physical properties, fluoride release and anti-microbial effects.²⁷⁻²⁸ In conjunction with these properties, their light polymerizability makes them very attractive, particularly as susceptibility to water degradation in the early phase of set is eliminated. For most composite and amalgam restorations, these findings will lead to the replacement of the more traditional liners and bases by certain light-cured fluoride containing liners.

Novel Fluoride-Releasing Materials

The desirability of fluoride release has not been lost in the development of new materials. Numerous studies have demonstrated fluoride uptake and caries inhibition from fluoride-containing compounds other than glass ionomers.²⁹⁻³² A variety of new restoratives with fluoride will be incorporated into practice in the next few years. These include existing as well as experimental composite resins, luting cements, adhesives, amalgam and varnishes. In the coming decade, no restoration will be placed without some fluoride containing component. As a result, secondary caries, as a reason for restoration replacement, will significantly decrease in frequency.

These developments have further implications for the composite restoration of cavities having margins on root surfaces. Previously, the rationale for the use of glass ionomer liners under composite resins has primarily been based on the fluoride release of the cement. The use of fluoride-containing adhesives and composites will obviate this rationale. Instead, a high-strength dentin adhesive with the potential for reducing, or eliminating contraction gap and microleakage will be used. Fluoride release from either of the materials will diminish tendencies toward recurrent caries. These shifts in technique will be further modified when non-contracting composites become a reality.

Composite Resins

Basic Aspects

Although composite resins have been consistently improving as restorative materials in anterior and posterior dentitions, work on matrix development and particle refinement continues to evolve. New monomers capable of expanding in volume on polymerization are being synthesized. Several prototype compounds of this type have been developed, some with the potential for adhesive bonding.³³⁻³⁵ The successful development of the latter types would eliminate the need for adhesive systems.

Composite formulations based on improved glass fillers as well as improved control of particle size and distribution are further leading to better composite performance. In particular, these changes will affect the transverse strength, which, in turn, should enhance marginal durability. This would significantly improve the functioning of directly-placed posterior composites, as marginal integrity has become more significant than wear as an issue in composite performance.³⁶

In addition, the refractory index of the glass particle has been made to more closely correspond to the index of the polymer matrix. This will enhance shade uptake of the surrounding tooth by the composite. Thus, fewer shades will be used in the future as the need for precise color matching will be reduced.

The use of expanding composites will have implications for clinical practice on a number of levels. First, the development of gaps with their ensuing events would be prevented. There would be no contraction forces to impact on cuspal deflection or create microfractures of enamel in bonded restorations. As much of the clinical handling of current composites is based on efforts to overcome contraction effects, the use of expanding composites would simplify restorative techniques. In essence, the long-term composite resin restoration of tooth surfaces would not be liable to small variances in manipulation. Technique sensitivity would thus be reduced and composites would become "amalgam-like" in handling. The result of these developments will be more durable and more esthetic composite resins for anterior and posterior restoration.

Clinical Aspects

One of the stimuli for the continued improvement of composite resins has been their use in the posterior dentition. A number of clinical trials have recently reported five-year results that place posterior composites in a better light than previously

considered. These data generally indicate that wear is well within the limits of the American Dental Association (ADA) guidelines for posterior composites. Five-year wear rates for various materials have been reported to be less than 100 micrometres (μm).^{36,37} More significantly, the wear rate peaks at three years and then levels off. Using statistical modeling, 12-year wear rates for several commercial composites have been estimated to range from 180-290 μm . These values appear comparable to the wear rates of amalgam in occlusal surfaces.^{38,39}

The limiting factor for posterior composite resins is becoming the marginal area, both in terms of integrity and leakage. As stated previously, this has become the focus for improvement in composite technology. It has been shown that hybrid composites perform better than microfilled materials for these parameters. Additionally, microfilled resins undergo significant surface damage in areas of stress.^{24,40}

Longevities of some directly-placed composites have been shown to be comparable to amalgam for several studies of five-years duration.^{36,41} Longevities beyond this period have been determined using statistical modeling. These have indicated that the half-life of 10 different composites ranged from 3.8 to 9.8 years, with a mean of 6.3 years.⁴² It should be noted that the values for currently used composites were at the upper end of the range. These data confirm the finding that the most significant factor in optimizing posterior composite performance is the selection of material.⁴³ The longevity values obtained by modeling compare very favorably to some cross-sectional studies on amalgam.^{44,45}

Directly-placed composite resins in the posterior dentition are therefore to be regarded more favorably than in the past. With new technologies improving current composites, and with the advent of compounds that will eliminate some of their technique-sensitive characteristics, the use of these materials will be significantly expanded in the next decade.

Composite Inlays

Earlier efforts at improving the clinical performance of directly-placed composites led to the development of composite inlays. It was believed that the degree of cure could be augmented by heat processing or light tempering, which in turn would improve wear rates. Additionally, the effects of composite shrinkage would be minimized, as already polymerized restorations would be luted using resin cements. As the cement film would be minimal in thickness, its contraction effect would be negligible.

Microhardness testing on various composites processed for inlay use indicates no significant increase in hardness values for heat curing when compared to light-cured samples.⁴⁶ These data correlate to the finding that clinical wear rates for a heat-cured inlay are similar to those for directly-placed composites.⁴⁷ In the same study, marginal chipping was commonly observed. This finding appeared to indicate that these inlays were not an improvement over similar light-cured composites when placed into posterior cavities.

The processing of composites for inlays can result in pre-cementation gaps at the margins, particularly those at the gingival wall.⁴⁸ The use of resin cements and dentin adhesives has been shown to eliminate these interfacial discrepancies. However, the exposed resin film, which has been measured to be generally less than 150 μm , could be liable to accelerated wear. Nonetheless, a primary advantage of resin inlays would be the possibility of developing excellent marginal adaptation.

In light of their less than ideal mechanical and clinical properties, the cost-benefit of indirect inlays may not warrant their routine use. However, the potential for developing excellent marginal adaptation, the ability to develop ideal anatomical form and finish restorations outside of the oral environment may make this technique attractive for large restorations.

CAD/CAM

One of the most novel methods devised for producing dental restorations involves the use of optical imaging in conjunction with computer-aided design and manufacturing (CAD/CAM). This technology is potentially the way of the future for producing indirect dental restorations.

Several systems have been developed along these lines.⁴⁹⁻⁵¹ One of these is currently available to dentists for the fabrication of ceramic inlays, onlays and veneers. The others are focusing on the CAD/CAM fabrication of crowns, which is technologically more complex. Thus, they are still under development,⁵² although prototype systems exist.

The accuracy of fit has been measured for several of the systems. For the inlay/onlay systems, pre-cementation gaps averaged 148 μm in one clinical trial,⁵³ while the marginal fit of a prototype crown system averaged 15 μm .⁵⁴ For ceramic restorations, as with composite inlay systems, resin cements are capable of filling gaps and producing perfect margins at the time of cementation.

In the clinical trial of the inlay/onlay system, 58 per cent of margins remained perfect at the end of one year. However,

the parameters of color match, interfacial staining and surface texture remained almost perfect. Additionally, no secondary caries were reported for this time period. The latter finding, along with the reporting of no interfacial staining, indicates that loss of perfect marginal adaptation does not correlate to loss of seal for the one-year period.

The glass ceramic used for the inlay/onlay restorations provides a functionality that appears to be significantly improved over conventional ceramics and composite resins. The enamel wear rate for porcelain and castable ceramics is still significant,⁵⁵ while wear rates for machinable ceramics have been stated to be comparable to enamel-on-enamel abrasion.⁵⁶ Furthermore, the microhardness of machinable glass ceramics has been shown to be four to five times that of unpolished composite resins.⁴⁶ If microhardness can be correlated to the maintenance of surface characteristics over time, machinable ceramics will have a significant impact on the durability of posterior restoration.

Biocompatibility

The last decade has witnessed renewed controversy concerning the biological safety of dental amalgam. This has been fueled by reports of high doses of inspired mercury from dental amalgams in humans as well as organ absorption of mercury in animal models.^{57,58} The data from the human experiments have been contested with respect to problems of estimates and gas flow dynamics.⁵⁹ Dosage estimates having an error of an order of magnitude 16 times higher than actual rates have been reported. Corrected for these errors, the inspirational volumes for mercury were well within the limits of safety established by the World Health Organization. Furthermore, it is difficult to make definitive conclusions concerning amalgam safety from animal studies as correlate values for toxicity in humans have not been demonstrated.

There is evidence to indicate that mercury is released from dental amalgams during mastication and accumulates in certain organs. However, there is no data to demonstrate any hazardous effects from these accumulations. On this basis, various organizations, including the Food and Drug Administration in the United States, the International Association for Dental Research, and the Canadian Dental Association have stated that dental amalgam is safe. Having been in use for over 150 years, having provided more long-term restorative service than any other material, being low in cost and having low technique sensitivity, dental amalgam will continue

to be regarded as the standard for direct posterior restorations.

Techniques

The coming decade will continue to see shifts in the approach to cavity preparation and restoration based on a decreased incidence of caries as well as the continued development of adhesive dentistry. Some of these developments have already been discussed. Others will be based on new evidence concerning the efficacy of the ultra-conservative restoration of occlusal caries. Their management by localized excision and restoration with amalgam and sealant, or by the placement of sealed composite over existing caries has proved effective over five- to six-year periods.^{60,61} Thus, the continuance of "extension for prevention" philosophies in unrestored occlusal surfaces may have little justification when adhesive procedures can accomplish similar goals with minimal tooth removal.

Conclusion

It is clear that dental practice continues to evolve on the basis of a combined effort in research and development. Despite continuing changes, the ideals of treatment in the future will be no different than those that have been around since the inception of modern dentistry. That is, careful, quality-based operative dentistry will continue to have the provision of health and comfort to patients as its primary goal.

However, based on research developments, clinical scenarios for the future may include the following. Data acquisition of tooth surfaces will be recorded and digitized using optical scanning devices. Clinical caries will be explored and quantified using electronic probes linked to computers. Existing restorations and their defect dimensions will be measured by computer. These data will be combined with risk assessments for disease to yield probabilities for caries progress as well as restorative failures. Restorative plans based on these and demographic data will be calculated by computers. Caries and failing restorative materials will be removed by lasers. Direct tooth restoration will be made using materials having long-term, high-strength adherence to dentin and enamel. Indirect restoration will be made using optical impressions and chairside fabrication. Further down the line, enamel cloning to restore tooth defects may become a reality. We'll see. Δ

References

1. National Institute of Dental Research: *Oral Health of United States Adults: The National Survey of U.S. Employed Adults and Seniors: 1985-1986*. NIH Pub. No. 87-2868, 1987.
2. National Institute of Dental Research: *Oral Health of United States Children: The National Survey of Dental Caries in U.S. School Children 1986-1987, National and Regional Findings*. NIH Pub. No. 2247, 1989.
3. Reinhardt, J.W. and Douglas, C.W. The need for operative dentistry services. Projecting the effects of changing disease patterns. *Op Dent* 14:114-120, 1989.
4. Loesche, W.J. *Dental Caries: A Treatable Infection*. Springfield, IL: Charles C. Thomas, 1982.
5. Anderson, M.H., Molvar, M.P. and Powell, L.V. Treating caries as an infectious disease. *Op Dent* 16, 21-28, 1991.
6. Loe, H. Dentistry in the 21st century. In *Dentistry in the 21st Century: A Global Perspective*. Ed. Simonsen, R.J. Chicago, IL: Quintessence Publishing, 17, 1991.
7. Martello, J., et al. Assessing the interest in caries diagnostic systems in dental practices. *J Dent Res* 70:364, Abstract No. 789, 1991.
8. Buonocore, M.G. A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces. *J Dent Res* 34:849-853, 1955.
9. Stangel, I., et al. Photoacoustic fourier transform IR spectroscopic study of polymer-dentin interaction. *Proceedings of an International Conference on Polymer-Solid Interfaces*. Namur, Belgium, 1991.
10. Stangel, I., Young, C. and Ruse, N.D. Surface priming and thermal stress effects on dentin adhesion. *J Dent Res* 70:363, Abstract No. 782, 1991.
11. Venz, S. and Dickens, B. Effects of primers and adhesives on micromorphology and strength of adhesive/dentin bonds. *J Dent Res* 70:363, Abstract No. 786, 1991.
12. Wang, T. and Nakabayashi, N. Effect of 2-(methacryloxy)ethyl phenyl hydrogen phosphate on adhesion to dentin. *J Dent Res* 70:59-66, 1991.
13. Nikaido, T., et al. Effect of sulfonamides and 4-META on adhesion to tooth substrates. *Dent Mater* 6:78-82, 1990.
14. Blosser, R.L. and Bowen, R.L. Effects of purified ferric oxalate/nitric acid solutions as a pretreatment for the NTG-GMA and PMDM bonding system. *Dent Mater* 4:225-231, 1988.
15. Munksgaard, E.G. and Asmussen, E. Dentin-polymer bond mediated by glutaraldehyde/HEMA. *Scand J Dent Res* 93:463-466, 1985.
16. White, J.M., et al. Nd:YAG Laser treated dentin/resin fracture surfaces. *J Dent Res* 70:394, Abstract No. 1026, 1991.
17. Seekamp, C., Lösche, G.M. and Roulet, J.F. The influence of laser pretreatment on dentin adhesion. *J Dent Res* 70:394, Abstract No. 1027, 1991.
18. Duke, E.S., Robbins, J.W. and Snyder, D.E. Dentin adhesive evaluation for restoring cervical abrasion lesions. *J Dent Res* 70:457, Abstract No. 1529, 1991.
19. Tyas, M. Clinical performance of dentin bonding agents in the enamel-etched class V abrasion lesion. *Aust Dent J* 35:459-462, 1990.
20. Wiley, P.M., Dennison, J.B. and Gregory, W.A. Clinical evaluation of a cervical retention groove in dentin bonding. *J Dent Res* 70:395, Abstract No. 1033, 1991.
21. Bastos, P., Teixeira, L. and Leinfelder, K. Three-year clinical evaluation of Scotchbond 2 as a dentinal adhesive. *J Dent Res* 70:395, Abstract No. 1031, 1991.
22. van Dijken, J.W. The effect of cavity pretreatment procedures on dentin bonding: a four-year clinical evaluation. *J Prosthet Dent* 64:148-152, 1990.
23. Stangel, I. Unpublished data.
24. Stangel, I. and Barolet, R.Y. A clinical evaluation of two posterior composite resins: two-year results. *J Oral Rehab* 17:257-268, 1990.
25. Strickland, S., Reteif, H. and Russel, C. Shear bond strengths to dentin and fluoride release from fluoride-containing liners. *Am J Dent* 3:259-263, 1990.
26. Poletto, L.T., et al. Shear bond strengths of liners to various human tooth surfaces. *J Dent Res* 70:478, Abstract No. 1700, 1991.
27. Scherer, W., et al. Antimicrobial Properties of VLC Liners. *J Esthet Dent* 2:31-32, 1990.
28. Tam, L.E. and McComb, D. Physical Properties of light-cured lining materials. *J Dent Res* 70:567, Abstract No. 2407, 1991.
29. Jensen, M.E., et al. *In vitro* recurrent caries: fluoride composites. *J Dent Res* 70:307, Abstract No. 332, 1991.
30. Pacropis, D.R. and Ibsen, R.L. Studies on a fluoride releasing adhesive to various substrates. *J Dent Res* 70:479, Abstract No. 1703, 1991.
31. Tantbirojn, D., Retief, D.H., and Russell, C.M. Enamel, cementum and dentin fluoride uptake from a fluoride-containing composite. *J Dent Res* 70:478, Abstract No. 1697, 1991.
32. El-Housseiny, A.A., Drake, D.R. and Wefel, D.S. Effect of fluoride-containing amalgams on growth of *streptococcus mutans*. *J Dent Res* 70:492, Abstract No. 1809, 1991.
33. Byerley, T., et al. Spiroorthocarbonates; polymerization and volume change determinations. *J Dent Res* 70:527, Abstract No. 2087, 1991.
34. Bowen, R.L. and Johnston, A.D. Novel dicarboxylic acid dimethacrylate monomer for dental applications. *J Dent Res* 70:527, Abstract No. 2089, 1991.
35. Stansbury, J.W. Improved monomers for double ring-opening polymerization with expansion. *J Dent Res* 70:527, Abstract No. 2088, 1991.
36. Stangel, I., Barolet, R.Y. and Robert, D. A clinical evaluation of two posterior composites: five-year results. (submitted).
37. Wisniewski, J.F., Leinfelder, K.F. and Isenberg, P. Five-year clinical evaluation of a fine particle posterior composite resin. *J Dent Res* 70:457, Abstract No. 1526, 1991.
38. Johnson, G.H., Bales, D.J. and Gordon, G.E. Direct clinical comparison of amalgam and composite restorations. *J Dent Res* 70:344, Abstract No. 629, 1991.
39. Lewis, G. *In vivo* occlusal wear of posterior composite restorations. *Op Dent* 16:61-69, 1991.
40. Tyas, M.J., et al. Clinical evaluation of six composite resins in posterior teeth. *Aust Dent J* 34:147-153, 1989.
41. Ohkubo, T., Ohkawa, A. and Katoh, Y. Study on posterior composites applied to small-size cavities: Five-year report. *J Dent Res* 70:457, Abstract No. 1525, 1991.
42. Bayne, S.D., et al. Clinical longevity of ten posterior composite materials based on wear. *J Dent Res* 70:344, Abstract No. 630, 1991.
43. Stangel, I. and Levinton, C. Covariate analysis of a posterior composite trial using recursive partitioning. *J Dent Res* 70:392, Abstract No. 1015, 1991.
44. Qvist, J., Qvist, V. and Mjor, I. Placement and longevity of amalgam restorations in Denmark. *Acta Odont Scand* 48:297-303, 1990.

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45. Mjör, I.A. Amalgam and composite resin restorations: Longevity and reasons for replacement. In *Quality Evaluation of Dental Restorations. Criteria for Placement and Replacement*. Chicago, IL. Quintessence Publishing, 61-68, 1989.
46. Shatz, P.C. and Stangel, I. Microhardness of variably polymerized composites. (In preparation).
47. Gray, W.A., et al. Clinical evaluation of indirect composite resin restorations — three-year results. *J Dent Res* 70:344, Abstract No. 633, 1991.
48. Peutzfeld, A. and Asmussen, E. A comparison of accuracy in seating and gap formation for three inlay/onlay techniques. *Op Dent* 15:129-135, 1990.
49. Rekow, D. Computer-aided design and manufacturing in dentistry: A review of the state of the art. *J Prosthet Dent* 58:512-516, 1987.
50. Duret, F., Blouin, J.L. and Duret, B. CAD-CAM in dentistry. *JADA* 117:115-120, 1988.
51. Moermann, W. and Brandestini, M. Method and apparatus for the fabrication of custom-shaped implants. US Patent No. 4,575,805, March 11, 1986.
52. Gaucher, H., Prévost, A. and Stangel, I. Conception et fabrication assistées par ordinateur d'incrustations et facettes en céramique. *J Dent Quebec* 18:145-149, 1991.
53. Isenberg, B.P., et al. Clinical evaluation of CEREC CAD/CAM restorations emphasizing marginal integrity. *J Dent Res* 70:434, Abstract

No. 1346, 1991.

54. Rekow, E.D., Thompson, V.P. and Yang, H.S. Margin fit of CAD/CAM produced crowns. *J Dent Res* 70:434, Abstract No. 1345, 1991.
55. Taft, R.M., et al. Wear of human enamel against a castable ceramic and porcelain. *J Dent Res* 70:539, Abstract No. 2185, 1991.
56. Moermann, W.H. A computer-aided ceramic restorative system. Symposium on *Posterior Restorations — A comparison of the new systems*. International Association of Dental Research, Cincinnati, 1990.
57. Hahn, L.J., et al. Whole-body imaging of the distribution of mercury released from dental fillings into monkey tissues. *Faseb J* 4:3256-3260, 1990.
58. Vimy, M.J. and Lorscheider, F.L. Dental amalgam mercury daily dose estimated from intra-oral vapor measurements: A predictor of mercury accumulation in human tissues. *J Trace Elem Exp Med* 3:111-123, 1990.
59. Mackert, J.R. Letter to the editor. *J Dent Res* 70:234-237, 1991.
60. Welbury, R.R., et al. The management of occlusal caries in permanent molars. A 5-year clinical trial comparing a minimal composite with an amalgam restoration. *Br Dent J*, 169(11):361-366, 1990.
61. Mertz-Fairhurst, E.J. and Ergle, J.W. Cario-static and ultraconservative sealed class I restorations: Six-year results. *J Dent Res* 70:492, Abstract No. 1812, 1991.



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Recherche et enseignement dans un domaine clinique, de préférence en infectiologie, ainsi que tâches de participation.

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Le (la) candidat(e) devra s'engager à consacrer au moins 70 p. cent de son temps au développement d'activités de recherche clinique et à l'encadrement d'étudiants de 2^e et 3^e cycles dans son domaine comme chercheur autonome et en collaboration avec le secteur fondamental et le secteur clinique.

Il (elle) enseignera au 1^{er} cycle dans son domaine.

Il (elle) collaborera également à l'enseignement et au développement de la recherche dans les autres programmes d'études avancées à l'École (gérodontologie, chirurgie buccale et maxillo-faciale, résidences multidisciplinaires, etc. . .)

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- D.M.D. ou D.D.S.
- Détenir un permis de pratique de l'Ordre des dentistes du Québec
- Détenir une maîtrise de type B
- Détenir ou s'engager à obtenir un Ph.D. dans son domaine
- Maîtriser la langue française.
- Avoir démontré une aptitude à la recherche clinique et à l'établissement de liens entre les cliniciens et la recherche.

TRAITEMENT

Selon la convention collective.

Les personnes intéressées devront soumettre leur curriculum vitae accompagné de trois (3) lettres de recommandation au plus tard le 31 octobre 1991.

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Acetaminophen is an analgesic and antipyretic

INDICATIONS:

TYLENOL* acetaminophen is indicated for the relief of pain and fever. Also as an analgesic/antipyretic in the symptomatic treatment of colds

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ADVERSE EFFECTS:

In contrast to salicylates, gastrointestinal irritation rarely occurs with acetaminophen. If a rare hypersensitivity reaction occurs, discontinue the drug. Hypersensitivity is manifested by rash or urticaria. Regular use of acetaminophen has shown to produce a slight increase in prothrombin time in patients receiving oral anticoagulants, but the clinical significance of this effect is not clear

PRECAUTIONS AND TREATMENT OF OVERDOSE:

The majority of patients who have ingested an overdose large enough to cause hepatic toxicity have early symptoms. However, since there are exceptions, in cases of suspected acetaminophen overdose, begin specific antidotal therapy as soon as possible. Maintain supportive treatment throughout management of overdose as indicated by the results of acetaminophen plasma levels, liver function tests and other clinical laboratory tests. N-acetylcysteine as an antidote for acetaminophen overdose is recommended and is available in oral and parenteral dosage forms. More detailed information on the treatment of acetaminophen overdose with N-acetylcysteine is available from the manufacturers of its oral and parenteral dosage forms, or contact your nearest Poison Control Information Centre

DOSAGE:

Adults
650 to 1000 mg every 4 to 6 hours not to exceed 4000 mg in 24 hours

Children

Based on Weight
10-15 mg/kg every 4 to 6 hours, not to exceed 65 mg/kg in 24 hours

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ATY-EJ-08/90

The effects of the helium-neon laser on postsurgical discomfort: A pilot study

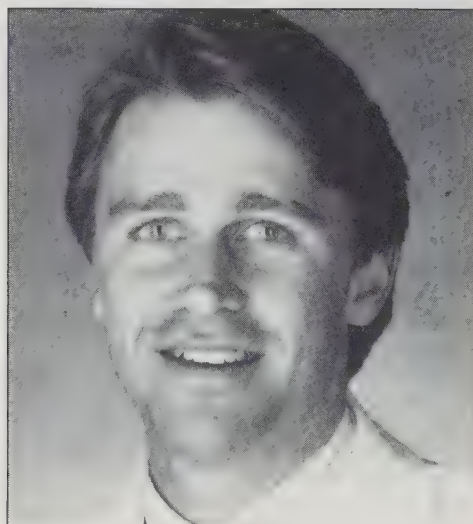
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ABSTRACT

It has been postulated that low-energy lasers (soft lasers) have analgesic capabilities. European investigators who have worked with these lasers have tried to explain this phenomenon as an interference with the mediation of the pain message and/or the stimulation of endorphin production. There does not appear, however, to be much well-controlled research to support these claims.

This study has examined the effect of the helium-neon laser on post-surgical discomfort. Fifteen patients who had surgical removal of bilaterally symmetrical mandibular third molars were evaluated. Laser therapy was applied to one side of each patient's mouth with the other side serving as the control. A similar technique of application, without activation of the laser beam, was utilized on the control side.

This study has demonstrated that the helium-neon laser (632.8 nanometre (nm) at 10 milliwatt (mW)), when applied to the surgical site for three minutes immediately following third molar surgery, reduced postoperative pain on the day of surgery and on the first postoperative day. This finding was statistically significant.



Dr. Cameron Clokie

On a découvert que le laser à hélium-néon [632,8 nanomètres à 10 milliwatts] réduit, quand on l'applique à la plaie durant trois minutes après l'extraction d'une dent de sagesse, les douleurs postopératoires le jour même de l'opération et le lendemain. Statistiquement, cette découverte est importante.

Key Words

pain intensity
soft laser
mandibular third molar surgery

helium-neon laser
infrared laser

Introduction

It has been postulated that low-energy lasers can stimulate certain biological processes.¹⁻⁶ Some investigators are of the opinion that the soft laser, when applied to the surgical site following a surgical procedure, will reduce the amount of postoperative pain experienced by the patient.^{4,7}

Investigators have tried to explain the analgesic property of the soft laser on two levels: at the level of pain mediation, and with the stimulation of endorphin production.⁸⁻¹¹ In 1983, P. Coche⁸ hypothesized that hyperstimulation induced by the application of low-energy lasers to nerve endings hyperpolarised the neuronal mem-

brane by raising its activation threshold. According to this hypothesis, it also stimulates the alpha fibres, blocking the pain influx to the posterior horn of the spinal cord.^{8,10}

Benedicinti⁹ suggested that laser stimulation results in endorphin secretion within the grey matter of the posterior horns. This was confirmed by the injection of narcotic antagonists, which he found reversed the analgesic effect obtained with low-energy lasers.⁸⁻¹⁰

These two theories are based on scientific work which has been carried out primarily in Europe. To our knowledge, no similar research has been undertaken in North America. Furthermore, these investigations were poorly controlled and were not designed for dental applications.

The two soft lasers most frequently used for analgesia are the infrared-gallium-aluminium-arsenide laser (830 nm) and the visible helium-neon laser (632.8 nm).⁴ There is no scientific evidence of superiority of one over the other. However, a survey of the literature indicates that the 632.8 nm irradiation of the helium-neon wave is more effective.⁴

The purpose of this study was to evaluate the analgesic capabilities of the helium-neon laser on postsurgical discomfort. Patients requiring bilateral mandibular third molar surgery were selected as the surgical models for this investigation.

Materials and Methods

Patients selected for this study:

1. required removal of mandibular third molar teeth with an identical surgical approach. (If maxillary third molars were to be removed during the same surgical procedure, an identical surgical approach for their removal would also be required.)
2. required a similar amount and technique of administration of a local anesthetic agent, if used, on both sides of the mouth. Intravenous sedation or general anesthesia could be utilized.
3. were age 16 to 65 years, inclusive.

SOMMAIRE

On a prétendu que les rayons lasers de faible intensité ont un pouvoir analgésique. Des chercheurs européens ont essayé d'expliquer ce phénomène en alléguant que le message de la douleur est bloqué et/ou que la production d'endorphine est stimulée. Pour appuyer ces dires, cependant, il ne semble y avoir guère de données bien vérifiées.

La présente étude a porté sur les effets du laser à hélium-néon sur les malaises postopératoires. Chez quinze patients à qui on venait d'extraire les dents de sagesse sur les deux côtés de la mandibule, on a traité un côté au laser, l'autre devant servir comme témoin. Pour le côté témoin, on a appliqué la même technique, mais sans activer le laser.

Patients excluded from this study:

1. were medically compromised.
2. had pacemakers.
3. were taking anti-inflammatory medication.
4. had known or suspected allergies to acetaminophen or codeine.
5. were unable to comprehend the questionnaire.

Surgery was performed by the same surgeon for each patient. Removal of maxillary third molars, when performed, preceded removal of mandibular third molars. Mandibular third molar surgery was performed using the envelope-flap technique as described by G.O. Kruger^{12,13} or the vertical-flap technique as described by K.H. Thoma.^{12,14} The same flap design was used bilaterally. Following removal of the tooth, the socket was irrigated with sterile saline and the mucosal flap closed with 4-0 plain gut sutures in interrupted fashion. This was followed immediately either by laser application or mock laser application to the surgical site.

The side of the mouth to receive laser therapy was determined by random distribution. A mock laser treatment was performed on the other side in a manner identical to the procedure used for a laser treatment, but without activation of the beam. This was done in such a manner that the patient was not aware of which side of the mouth received laser therapy. This created a single blind study with the contralateral side serving as the control.

Laser therapy was performed using the helium-neon laser (10 mW Orion Dental Laser, Laser Médical International, Montréal, Québec) with a wavelength of 632.8 nm and a power of 10 mW. It was used in continuous mode by means of a fibre-optic cord. The extraction site was kept free of blood and/or saliva, and the beam was moved over the surgical site at a distance of two millimetres (mm) for three minutes. The spot size was estimated to be 4.9 mm². The output power at the end of the fibre-optic cord was 5.4 mW/cm².

All patients were prescribed a combination of codeine, 30 milligrams (mg), and acetaminophen, 325 mg, to be taken orally every four hours as required for pain. Patients were requested to complete a questionnaire which recorded the amount of pain medication taken and the amount of pain experienced.¹⁵

Prior to taking the analgesic medication, patients were asked to assess their pain intensity¹¹ according to the following scale: none = 0; mild = 1,2,3; moderate = 4,5,6; severe = 7,8,9.

Following the baseline assessment, patients were asked to record their pain intensity at two-hour intervals until bedtime on the day of surgery. Pain intensity was assessed upon waking and before going to bed on each of the two days following surgery.

Patients returned for postoperative assessment one week after surgery. The questionnaire was reviewed with the patient and the surgical sites were evaluated by the treating surgeon. Obvious differences in swelling, comparing one side to the other, were noted.

Results

Fifteen patients, five males and 10 females, ranging in age from 16 to 35 years with a mean of 19.4 years, were selected for this study. Eight patients received laser therapy on the right side of the mouth and seven patients on the left side. **Table I** provides a comparison of the patients' experience of pain and swelling at different times, postoperatively.

On the day of surgery (**Table II**), the assessment of pain intensity revealed that nine patients (60 per cent) experienced less

TABLE I

Comparison of patients experiencing pain and swelling at different times postoperatively

Patient	Sex	Age	PAIN									SWELLING		
			Day of Surgery			1 Day Post-Op			2 Days Post-Op			1 Week Post-Op		
			S	GC	GL	S	GC	GL	S	GC	GL	S	GC	GL
1	F	21			X			X	X			X		
2	F	22		X			X			X				X
3	M	24		X			X			X		X		
4	F	23		X			X			X				X
5	F	16			X			X			X	X		
6	M	19			X			X			X	X		
7	M	18		X			X			X				X
8	F	20	X			X			X				X	
9	M	21		X			X				X	X		
10	F	26		X			X			X		X		
11	F	29		X			X				X			X
12	M	35		X			X			X		X		
13	F	20	X			X			X			X		
14	F	19		X			X			X			X	
15	F	21	X			X			X			X		
TOTAL			3	9	3	3	9	3	4	7	4	7	4	4

S = similar on both sides

GC = greater on control side of mock laser application

GL = greater on test side of laser application

TABLE II

Patients' assessment of pain intensity as recorded on the operative day, the first postoperative day and the second postoperative day

Pain	Day of Surgery		1 Day Post Op.		2 Days Post Op.	
	#	%	#	%	#	%
Same on Both Sides	3	20.0	3	20.0	4	26.7
Less Pain on Laser Side	9	60.0	9	60.0	7	46.7
Less Pain on Control Side	3	20.0	3	20.0	4	26.7

pain on the side of the mouth that received laser therapy. Three patients (20 per cent) had less pain on the control side and experienced more pain on the side that received laser therapy. Three patients (20 per cent) recorded no difference.

On the first postoperative day (Table II), the results were similar to those on the day of surgery: nine patients experienced less pain on the side of the mouth receiving laser therapy, three patients experienced more pain on the side receiving laser therapy and three patients recorded no difference.

On the second postoperative day (Table II), changes were noted. Two patients, who previously recorded less pain on the side of the mouth receiving laser therapy, recorded more pain on that side. One patient, who had recorded more pain on the side receiving laser therapy, recorded no difference of pain intensity on the two sides.

One week following surgery, when patients returned for their postoperative assessment, the treating surgeon found that seven patients (46.7 per cent) had no clinical difference in the amount of swelling on either side of the mouth (Table III). In four patients (26.7 per cent), greater swelling was observed on the side that received laser therapy. Four patients (26.7 per cent) had greater swelling on the side that did not receive laser therapy.

TABLE III

Amount of swelling seven days postoperatively as evaluated by the treating surgeon

Swelling	Number of Patients	Percentage of Sample
Same on Both Sides	7	46.7
Greater on Control Side	4	26.7
Greater on Laser Side	4	26.7

Discussion

Analysis of pain-intensity ratings on the day of surgery and on the first postoperative day indicated a statistically significant (Chi-square $P < 0.05$) reduction of pain on the side of the mouth receiving laser therapy. Patients evaluated their pain intensity to be less, following mandibular third molar removal, on the side where soft-laser therapy had been applied. On the second postoperative day, however, analysis of the results showed no statistically significant (Chi-square $P > 0.05$) reduc-

tion of pain intensity on the side receiving laser therapy.

There was no statistically significant (Chi-square $P > 0.05$) reduction of swelling on the side of the mouth receiving laser therapy. It is interesting to note that there was no correlation between swelling and pain. Four patients were observed to have more swelling on the control side. Of these four patients, two rated their pain intensity to be greater on the control side, one recorded greater pain intensity on the laser side and one recorded no difference. Four patients were observed to have greater swelling on the side receiving laser therapy. Of these four patients, all had recorded their pain to be greater on the control side.

The changes in pain intensity recorded on the second postoperative day may be the result of several factors. The numbers in this study were small, and a greater sample size may be required. It has been suggested that the effect of the laser is best when the surgical site remains untraumatized.¹¹ Following third molar extraction, a patient may start to function more actively by the second postoperative day, thus inadvertently traumatizing the area.

Others have suggested that more than one exposure to the soft laser is required in order to achieve its maximal effect.¹¹ Perhaps repeated applications are required on subsequent postoperative days. Further investigation may indicate that the benefit gained is significant. However, if the protocol remains unchanged, such laser therapy would prove to be too time consuming. The authors found even the three-minute post-extraction exposure time disruptive.

In order to decrease the time of laser application, the power must be increased in order to achieve the same physiologic effect. To do so with the helium-neon laser requires an appliance which is too large and too cumbersome to be clinically useful. However, this may be achieved with the infrared gallium-aluminium-arsenide laser (830 nm) without significantly altering the system presently available. The biostimulative effects discussed in this paper have all been related to the helium-neon laser. Further investigation is required to determine the biostimulative effects of the infrared laser.

Conclusion

This study has demonstrated that the helium-neon laser (632.8 nm at 10 mW), when applied to the surgical site for three minutes immediately following mandibular third molar surgery, will reduce postoperative pain on the day of surgery and on the first postoperative day. Δ

Acknowledgements

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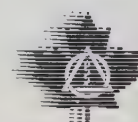
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References

1. Fork, R.L. Laser stimulation of nerve cells in Aplysia. *Science* 171: 907-908, 1971.
2. Haina, D. et al. Animal experiments in light-induced wound healing. *Laser Basic Biomed Res* 22:1-3, 1982.
3. Mester, E. et al. The biostimulative effect of laser beam. *Laser Basic Biomed Res* 22:4-7, 1982.
4. Basford, J.R. Low energy laser treatment of pain and wounds: Hype, hope, or hokum? *Mayo Clin Proc* 61:671-675, 1986.
5. Lam, T.S. et al. Laser stimulation of collagen synthesis in human skin fibroblast cultures. *Laser Life Sci* 1:61-77, 1986.
6. Hallman, H.O. et al. Does low-energy Helium-Neon laser irradiation alter "in vitro" replication of human fibroblasts? *Lasers Surg Med* 8:125-129, 1988.
7. Wolbarst, M.L. *Laser Applications in Medicine and Biology*. Vol. 1. New York, Plenum Press, 1971, pp. 91-123.
8. Coche, P. L'énergie douce face à la douleur. *Edit Techno-Synthèse SA* 53-63, 1985.
9. Benedicinti, A. Le possibilità della laserterapia nella cura della nerralgia del trigemino. *Parodontologia e Stomatologia (Nuova)* 3:138-145, 1979.
10. Franquin, J.C. The principles of clinical use for the helium-neon laser in odontology. *Laser Méd International*, Montréal, 1987.
11. Melzack, R. The McGill pain questionnaire: Major properties and scoring methods. *Pain* 1:277-299, 1975.
12. Chin Quee, T.-A. et al. Surgical removal of the fully impacted mandibular third molar. *J Periodont* 56:625-630, 1985.
13. Kruger, G.O. Management of impactions. *Dent Clin N Am*, Nov., 707, 1959.
14. Thoma, K.H. The management of malposed inferior third molars. *J Dent Res* 12:175, 1932.
15. Bell, W.E. *Orofacial Pains: Classification, Diagnosis and Management*. Chicago, Yearbook Medical Publishers Inc., 1985, pp. 325-355.

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Labial endodontic access opening for mandibular incisors: Endodontic and restorative considerations

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ABSTRACT

A labial access opening is suggested for endodontic treatment of mandibular incisors. This approach facilitates the identification and instrumentation of two canals, if present, and enhances achievement of complete obturation. More coronal tooth structure is preserved, enabling an optimum dowel core design for bracing the root.

SOMMAIRE

Pour le traitement endodontique des incisives de la mandibule, on recommande de pratiquer une incision du côté labial. Avec cette méthode, on facilite l'identification des deux canaux, s'il y a lieu, ainsi que la manoeuvre instrumentale, on réalise une meilleure obturation, on préserve davantage la structure coronaire de la dent et on peut mieux planter le tenon pour en consolider la racine.

Introduction

The strength of an endodontically-treated tooth is directly related to the bulk of the remaining tooth structure.¹ If an adequate remaining tooth structure exists, no significant reinforcement of endodontically-treated teeth with a cemented dowel² can be anticipated, as the tooth preparation required for dowel placement may decrease the teeth's resistance to fracture.^{3,4} However, endodontic and restorative preparation procedures which conserve tooth structure while providing for the placement of a dowel-core foundation maintain the maximum resistance of the root to fracture.⁵

The purpose of dowel placement is to provide adequate retention form and resistance form to the core section.⁶ Excessive removal of tooth structure should be avoided, as the bulk of the remaining structure and the bracing effect of an appropriate core design — not the size of the dowel — impart strength and resistance to fracture.⁷

Morphological Considerations

Conserving both the coronal and root dentin is critical to the successful restoration of the endodontically-treated tooth. The relatively small coronal dimensions of mandibular incisors create some difficulty in terms of retaining an adequate amount of dentin, even with conservative endodontic instrumentation, particularly if a full-coverage crown is indicated. Even the minimum depths of reduction of incisal and axial surfaces necessary to achieve esthetic and physiologic contours, and the endodontic access opening and pulp chamber instrumentation, result in insufficient remaining coronal dentin. Thus a dowel core foundation is invariably required for endodontically-treated mandibular incisors on which a full-coverage crown or retainer must be placed.

The cross-sectional dimensions and proximal fluting of mandibular incisor roots severely restrict the diameter to which the canal may be enlarged for a dowel if an adequate thickness of dentin is to be maintained around the dowel. Excessive enlargement of the canal will compromise both the cervical strength of the tooth and the potential for bracing the root with the core component of the foundation, as well as presenting a measurable risk of lateral perforation of the root on its proximal surfaces.

Endodontic Considerations

The objective of the coronal access opening is to locate the pulpal orifices of the canals, provide straight-line access to the apical third of the root, and to establish the restorability of the tooth. The traditional lingual access used for the endodontic instrumentation of mandibular incisors presents measurable disadvantages in both endodontic and prosthodontic management. Labial access opening for endodontic instrumentation not only conserves coronal dentin, it does so in a manner that provides biomechanical advantages in root bracing with the dowel core.

The incidence of two canals being present in mandibular incisors is 22 per cent

to 41.4 per cent.⁸⁻¹² A survey of the claim submissions to a major third-party insurance carrier indicates, however, that only two per cent (N = 209) of mandibular incisors are treated endodontically as having two canals.¹³ This large discrepancy is attributed to the internal cingulum deflection¹² that occurs with the lingual-access approach. Where single canals are treated, this same deflection results in the filing and filling of only the labial portion of the canal system.^{11,12}

Thus the significant limitations of the lingual-access approach for the treatment of mandibular incisors are in the identification of the presence of two canals, and in the lack of straight-line access to the apical third of the root¹¹ for effective instrumentation and obturation of the canals, regardless of the number present.

Core Design: Biomechanical Considerations

A desirable attribute of the core is a ferrule effect, which can be achieved through the encirclement of the cervical tooth structure.^{14,15} A ferrule is defined as a metal ring encircling an object to provide added strength.¹⁶ Providing for a ferrule to telescope over the coronal preparation for the core (fig. 1) enables the bracing of the coronal dentin and the root to resist bend-

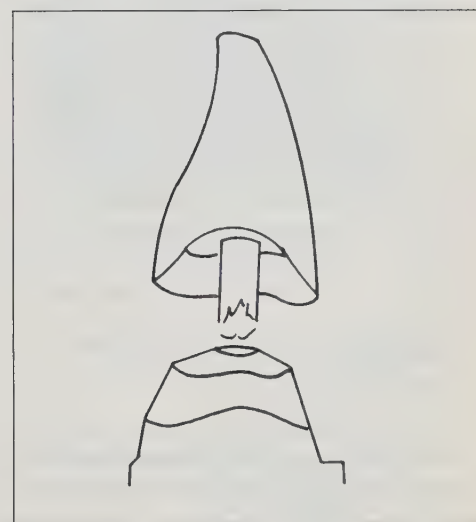


Fig. 1. Ferrule concept.

ing and/or the fracture of both the post and the root.

The more dentin encompassed in the core, the more favorable the stress distribution to the root will be, with much less stress concentration at the gingival level.¹⁷ The remaining dentin thickness, from the perimeter of the dowel preparation to the root surface, should be at least one millimetre (mm).¹⁸⁻²⁰

The vertical height of the dentin that remains following crown preparation markedly affects the fracture resistance of a tooth restored with a dowel core foundation. Maintaining at least 1 mm of coronal dentin above the crown margin doubles the failure threshold of the pulpless tooth.¹⁸ Furthermore, the placement of a bevel in providing a ferrule component appears to enhance the resistance to cementation failure.^{18,20} However, it is apparent that the remaining dentin thickness and its vertical height are the critical factors in protecting coronal and radicular tooth structure from potential fracture forces.

Dowel Design: Biomechanical Considerations

The stress on the supporting tooth structure generally increases as the post diameter increases.²¹ Consequently, endodontically-treated teeth restored with smaller diameter dowels have an increased resistance to fracture compared to teeth receiving larger diameter posts.²² The recommended maximum diameter of the required dowel is 1 mm²³ to 1.25 mm, with its diameter not to exceed one-third the diameter of the root.²²

A longer dowel not only distributes forces more evenly to the supportive root structure, it also reduces the stress at the junction of the dowel and the core components; regardless of the length of the dowel, the highest stresses are concentrated at the junction of the core and remaining dentin, and at the apex of the dowel on the opposite side of the force application.²³ Tensile stresses are largest on the inner surfaces of the proximal sides of the root.²⁴ It is apparent that a greater post diameter and excessive removal of coronal dentin increase the stress on the root of a tooth restored with a dowel core foundation.

Analysis: Labial Access Opening

A greater mass of coronal dentin is preserved using the labial-endodontic-access opening technique for mandibular incisors, subsequent to the removal of additional dentin for a path of insertion of

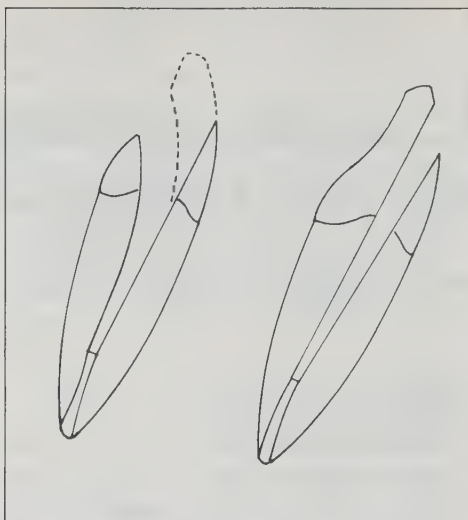


Fig. 2. Remaining dentin with labial and lingual access openings with path of insertion preparation for dowel.

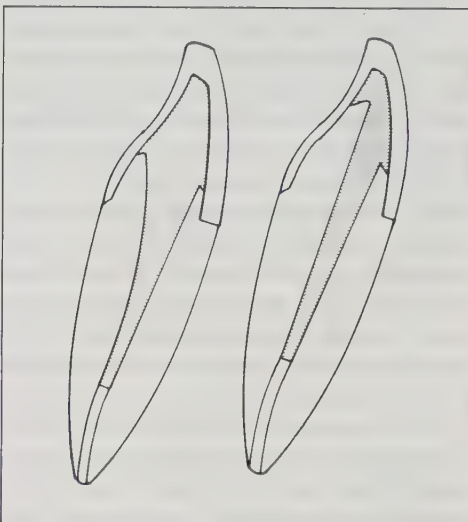


Fig. 3. Remaining dentin with dowel core pattern completed.

the dowel core (fig. 2). The completed preparation of both coronal dentin and the canal results in considerably greater remaining dentin thickness and vertical height on the lingual aspect when a labial-access opening is used in comparison to the use of lingual-access opening (fig. 3).

In addition to the bracing action of a ferrule accommodated by bevelling the seating junction of the core with coronal tooth structure, the thickness of dentin preserved in the cingulum area contributes to root integrity. This bulk enhances the tooth's capability to resist the tendency of lingually-directed functional forces on the dowel core, which otherwise potentiate vertical root fracture due to the inherent flexibility of the root (fig. 4).

Restorative Recommendations

The labial access opening preserves critically important lingual tooth structure.

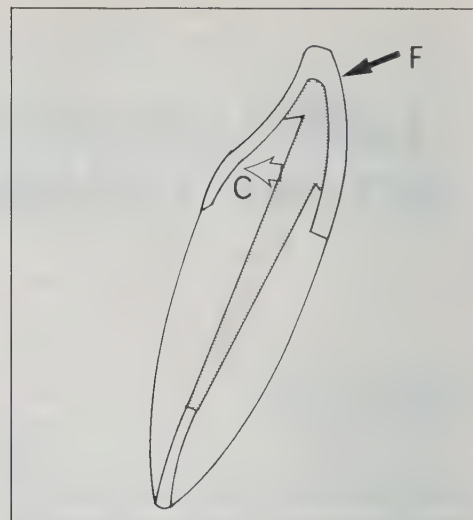


Fig. 4. Lingual bulk of dentin resists functional stresses. (F = force, C = compressive stress).

Provision for the placement of a ferrule at the interface between the core portion and coronal dentin can be routinely achieved. To preserve the remaining dentin thickness at the cervical level, the maximum cross-sectional dimension of the dowel should not exceed 1.25 mm.

Mandibular incisors should routinely be prepared for a custom dowel, permitting maximum dentin to be preserved by a dowel which conforms to the cross-sectional contour of the root with its proximal fluting. The cylindrical nature of prefabricated dowels necessitates an excessive enlargement of the lumen of the canal to achieve precise adaptation, with the unavoidable weakening of the tooth structure and the inherent risk of root perforation.

Analysis of Potential Problems

If an insufficient vertical height of tooth structure is available to allow the bracing of the root with a ferrule component of the core, either coronal lengthening should be prescribed or the tooth deemed unrestorable. A consensus opinion is that the minimum vertical length, measured radiographically from the height of the crestal bone, is 5 mm.²⁵ If severe funnelling of the cervical level of the canal exists, the tooth becomes either unrestorable or presents a very poor prognosis.

Summary

A labial-access opening for mandibular incisors facilitates the localization of two canals, when present, during endodontic instrumentation. Concurrently, coronal tooth structure is preserved, allowing optimum bracing of the root with a dowel core foundation which can incorporate ideal biomechanical design principles. Δ

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References

1. Hock, D. Impact resistance of post and cores. M.Sc. Thesis, University of Michigan, 1976.
2. Lovdahl, P.E. and Nicholls, J.I. Pin-reinforced amalgam cores vs. cast dowel cores. *J Prosth Dent* 38:507-514, 1977.
3. Guzy, G.E. and Nicholls, J.I. *In vitro* comparison of intact endodontically treated teeth with and without endo-post reinforcement. *J Prosth Dent* 42:39-41, 1979.
4. Kantor, M.E. and Pines, M.S. A comparative study of restorative techniques of pulpless teeth. *J Prosth Dent* 38:405-412, 1977.
5. Sorensen, J.A. and Martinoff, J.T. Clinically significant factors in dowel design. *J Prosth Dent* 52:28-35, 1984.
6. Nathanson, D. New restorative concepts for post and cores. *J Clin Dent* 1:44-45, 1988.
7. Sorensen, J.A. Preservation of tooth structure:

the key to successful restoration. *J Clin Dent* 1:39-40, 1988.

8. Vertucci, F.J. Root canal anatomy of the mandibular incisors. *JADA* 89:369-371, 1974.
9. Benjamin, J.A. and Dawson, J. Incidence of two root canals in human mandibular incisor teeth. *Oral Surg* 38:122-126, 1974.
10. Warren, E.M. and Laws, A.J. The relationship between crown size and the incidence of bifurcated root canals in mandibular incisor teeth. *Oral Surg* 52:425-429, 1981.
11. Rankin-Wilson, R.W. and Henry, P. The bifurcated root canal in mandibular incisor teeth. *JADA* 70:1162-1165, 1965.
12. Clements, R.E. Unpublished research on 264 mandibular incisors. Presented at the Annual Meeting, Canadian Association of Endodontists, Edmonton, 1986.
13. Alberta Blue Cross statistics, June 1, 1989 to March 31, 1990.
14. Caputo, A. and Standlee, J. Basic principles of posts: a foundation for the future. *J Clin Dent* 1:45-47, 1988.
15. Barhordar, R.A., Radke, R. and Abbasi, J. Effect of metal collars on resistance of endodontically treated teeth to fracture. *J Prosth Dent* 61:676-678, 1989.
16. DeSort, K.D. The prosthodontic use of endodontically treated teeth: Theory and biomechanics of post preparation. *J Prosth Dent*

49:203-206, 1983.

17. Henry, P.J. Photoelastic analysis of post core restorations. *Oral Health* 69:47-49, 1977 (Reprinted from Australian Dent J).
18. Sorensen, J.A., Engelman, M.J. and Mito, W.T. Effect of ferrule design on fracture resistance of pulpless teeth. *J Dent Res* 67:130 (Abstract 147), 1988.
19. Caputo, A.A. and Standlee, J.P. Pins and posts - why, when and how. *Dent Clin N Am* 20:299, 1976.
20. Tjan, A.H.L. and Whang, S.B. Resistance to root fracture of dowel channels with various thicknesses of buccal dentin walls. *J Prosth Dent* 53:496-500, 1985.
21. Mattison, G.D. Photoelastic stress analysis of cast-gold endodontic posts. *J Prosth Dent* 48:407-411, 1982.
22. Trabert, K.C., Caputo, A.A. and Abou-Rass, M. Tooth fracture - A comparison of endodontic and restorative treatments. *J Endodont* 4:341, 1979.
23. Colman, H.L. Restoration of endodontically treated teeth. *Dent Clin N Am* 23:647, 1979.
24. Derand, T. The principle stress distribution in a root with a loaded post in model experiments. *J Dent Res* 56:1463-1467, 1977.
25. 1989 Survey of the Alberta Society of Prosthodontists (unpublished).



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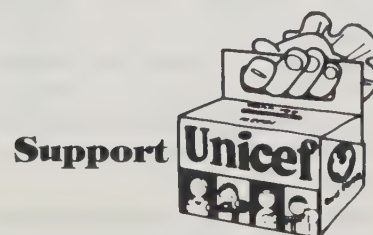
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Évaluation de la traumatologie maxillo-faciale dans un hôpital de Québec

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Chirurgien Buccal et Maxillo-Facial
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SOMMAIRE

L'objet de cet article porte sur une étude conduite auprès des traumatisés relevant de la spécialité maxillo-faciale de l'hôpital Christ-Roi de Québec. L'échantillon de patients représente les trois premières années d'instauration du service de chirurgie buccale et maxillo-faciale. Ce centre est un hôpital de 200 lits.

Dans cette étude, nous examinons les différentes données épidémiologiques ainsi que le type de traumatisme. Les traitements fournis aux patients sont également discutés et une corrélation avec la littérature supporte l'analyse des données.

ABSTRACT

This article describes a study done on patients with maxillofacial traumas at the Hôpital Christ-Roi in Quebec City. The patients were selected from those treated during the first three years after the Oral and Maxillofacial Surgery Department was set up. The hospital has 200 beds.

In this study, the different epidemiological data and traumatic type are examined. Patient treatment is also discussed. The data analysis is supported by existing literature on the subject.

Introduction

L'hôpital Christ-Roi de Québec est un hôpital général d'une capacité de 200 lits dont 179 sont réservés pour les soins aigus répartis entre la médecine (113) et la chirurgie (66); 21 lits sont utilisés pour les patients à séjour prolongé.

Il s'agit d'un hôpital qui dessert un bassin de population de 35 000 personnes. Les services chirurgicaux habituels d'oto-rhino-laryngologie (ORL), d'ophtalmologie, de chirurgie générale et d'orthopédie y sont dispensés. Sa vocation traumatologique est restreinte, les cas médicaux accaparant davantage l'urgence. Depuis trois ans, l'ajout de la chirurgie buccale et maxillo-faciale a permis de traiter un grand nombre de patients électifs et traumatisés. Ce sont ces derniers qui feront l'objet de notre étude.

Rappelons qu'avant l'installation du service, les patients affligés d'un traumatisme

facial étaient traités en ORL ou référés à d'autres centres.

Matériel et méthode

Étant donné qu'il ne s'agit pas d'un hôpital de référence en traumatologie, ce sont surtout des patients ambulants qui se rendent d'eux-mêmes à l'urgence pour fin d'évaluation. Tous les patients référés par l'urgence ou directement au service de chirurgie buccale et maxillo-faciale sont inclus dans l'échantillon de cette étude qui porte sur une période de trois ans, soit depuis l'implantation du service en janvier 1986.

Les patients ont tous été examinés par le même chirurgien buccal (FB). Les paramètres généraux de sexe et d'âge seront analysés ainsi que les causes et les types de traumatisme. Le traitement apporté est également révisé et une discussion s'ensuit.

Résultats

Cent vingt-cinq demandes de consultation ont été adressées en chirurgie maxillo-faciale. Au total, 74,4 pour cent sont de sexe masculin pour un rapport H/F de 2,9/1 (Tableau I). L'âge moyen est de 25,02 ans avec un écart variant d'un à 90 ans. Le Tableau II montre la répartition par décade de façon globale.

La décortication annuelle n'apporte pas d'éléments utiles à notre analyse. Soulignons que 50,4 pour cent des patients se situent dans les deuxième et troisième décades et que les quatre premières décades regroupent plus de 81,6 pour cent des patients.

La répartition mensuelle n'a pas apporté d'indices quant à une recrudescence estivale. De façon générale, le mois de mai semble avoir été plus actif par rapport aux autres mois de l'année avec 17 consulta-

tions (13 pour cent) pour traumatisme facial. Le Tableau III nous permet de constater la cause des traumatismes faciaux évalués dans notre centre hospitalier : 31,2 pour cent sont reliés aux sports, 28 pour cent, aux assauts, 28 pour cent, aux chutes. Les accidents impliquant des véhicules moteurs (automobiles, motocyclettes) ne comptent que pour 10,4 pour cent.

Les traumatismes produits sont variés, mais en général peu sévères, et sans association à d'autres traumatismes physiques ou même faciaux. Un seul cas présentait une fracture demi Le Fort I associée à une fracture de l'os malaire. Un autre présentait une fracture de l'os malaire et du nez. Les fractures du nez sont souvent traitées en ORL et ne sont pas un reflet adéquat de l'incidence de ce type de fracture. Pour simplifier la classification, les fractures de l'os malaire incluent les fractures de l'orbite.

De fait, l'os malaire représente anatomiquement une portion du plancher et de la

TABLEAU II

Répartition par décade

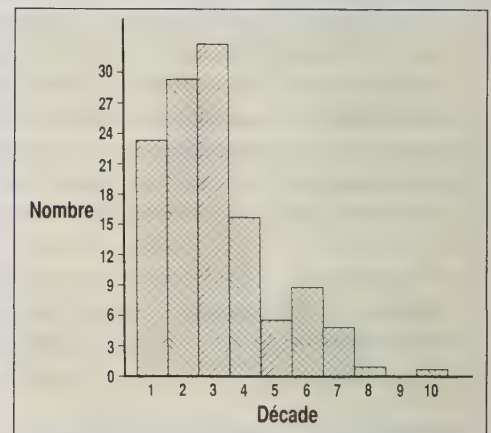


TABLEAU I

Répartition selon le sexe

	1986	1987	1988	TOTAL
Hommes	35	32	26	93
Femmes	12	12	8	32
TOTAL	47	44	34	125

paroi latérale de l'orbite. Plusieurs cas de contusions (20 pour cent), sans fracture sont présents, probablement examinés à cause de la nouvelle disponibilité d'un chirurgien buccal sur place ou de l'incertitude du médecin général face à ces cas (Tableau IV).

Le traitement apporté poursuit les objectifs suivants : restaurer la fonction, la symétrie, la continuité et l'apparence. Parmi l'échantillon, 67,2 pour cent des patients n'ont pas eu de thérapie active. Ce pourcentage inclut les patients qui ont refusé le traitement proposé (Tableau V).



Discussion

Les hommes constituent la majorité des personnes impliquées en traumatologie.^{1,2} Ellis¹ en rapporte 80 pour cent dans une étude publiée en 1985. Nous en relevons 74,4 pour cent. Quant à l'âge, notre série se situe entre un et 90 (un et 70 en excluant une patiente de 90 ans), comparativement à trois et 76 pour Ellis. Cependant, cette dernière étude effectuée à Glasgow, en Écosse, ne porte que sur les cas de fractures orbito-malaires.

Il est à noter que, dans notre rapport, les accidents sportifs sont nombreux : ils représentent 31,2 pour cent, suivis par les assauts à 28 pour cent. Le nombre de chutes est important, ce qui laisse penser que certains ont peut-être préféré rapporter cette cause plutôt que celle de l'assaut, plus difficilement avouable. Au questionnaire, il est courant pour les patients de citer la chute comme facteur causal alors qu'ils

furent impliqués dans une bagarre. Ce point a été noté par Moos.²

Quant aux jeunes de 10 ans et moins (23 patients), les causes sont surtout les chutes ou les accidents sportifs. Le faible taux d'accidents associés aux véhicules moteurs (10,4 pour cent) s'explique sans doute par la sévérité des règlements de circulation qui réduit considérablement les accidents de la route.³ Une autre explication de ce faible pourcentage pourrait être que notre centre est peu connu des ambulanciers.

Parmi les types de traumatismes, il s'agit principalement de traumatismes impliquant des fractures uniques au niveau du visage excluant deux cas de fractures d'os malaire, combinées à un demi Le Fort I pour l'un et à une fracture du nez pour l'autre. Les fractures de l'os malaire représentent la majeure partie des fractures soit 34/125 (27,2 pour cent). Considérant les cas d'agression, l'os malaire gauche fut fracturé plus fréquemment (75 pour cent) et ce point est respecté dans la littérature¹ étant donné la plus grande fréquence de droitiers.

Les fractures de l'os malaire et de la mandibule touchent 52 pour cent des patients examinés et ce chiffre augmente à 68,4 pour cent si les contusions et les plaies sont exclues. Le nez est la structure anatomique du visage la plus fréquemment fracturée^{4,5} mais étant donné que les cas isolés de fracture du nez sont généralement référés en ORL, l'incidence de ce type de fracture se trouve donc diminué par rapport aux autres fractures maxillo-faciales.

Un traitement conservateur est souvent choisi pour ces patients : (84/125) 67,2 pour cent. Les patients ayant refusé la chirurgie sont également inclus dans ce pourcentage. Il a été noté dans l'article de Ellis¹ que 23 pour cent des fractures orbito-malaires étaient traitées de façon conservatrice. Par ailleurs, la nécessité de stabiliser ce type de fracture varie beaucoup selon les auteurs.⁶ Dans notre étude, 16 pour cent ont nécessité des réductions fermées, et 9,6 pour cent, des réductions ouvertes. Par ailleurs, neuf patients ont nécessité des réparations de plaies et de fractures alvéolaires. Il est difficile de comparer notre étude de façon générale alors

TABLEAU III

Répartition des traumatismes faciaux selon la cause

	1986	1987	1988	TOTAL
Sport	21	9	9	39
Assaut	13	17	5	35
Auto-moto	4	7	2	13
Chutes	8	10	17	35
Autres	1	1	1	3

TABLEAU IV

Distribution selon le traumatisme

	1986	1987	1988	TOTAL
Fracture alvéolaire	9	5	12	26
Fracture mandibulaire	9	16	6	31
Fracture malaire	11	12	11	34
Fracture nasale	2	2	0	4
Plaies et contusions	16	9	5	30

TABLEAU V

Distribution selon le traitement

	1986	1987	1988	TOTAL
Réduction fermée	8	7	5	20
Réduction ouverte	4	4	4	12
Divers *	7	1	1	9
Non chirurgical	28	32	24	84

que les auteurs se limitent souvent à étudier un type particulier de traumatisme facial ou encore ils n'incluent pas les fractures dento-alvéolaires.⁷ Il ne semble pas exister d'études en tout point comparable à la nôtre.

Conclusion

Cette étude dresse le bilan global de la traumatologie maxillo-faciale après trois ans au centre hospitalier Christ-Roi de Québec. Le nombre de traumatisés est possiblement moindre que dans les grands centres de traumatologie. Nos patients sont en général ambulants et se rendent d'eux-mêmes à l'urgence pour ensuite être référés en chirurgie buccale et maxillo-faciale. Il s'agit donc surtout de patients traumatisés « plus légers » qui résident sur le territoire desservi par l'hôpital. L'accès en salle d'opération étant relativement rapide, les délais pour effectuer le traitement définitif sont en général courts et le temps d'hospitalisation par conséquent est diminuée.

À l'heure actuelle, il est permis d'affirmer que les données générales recueillies et les résultats obtenus présentent une similitude avec d'autres études publiées. Toutefois, l'originalité de cet article tient au fait que nous évaluons les traumatismes faciaux de façon générale. Souvent, les auteurs ne traitent que d'un type spécifique de traumatisme, par exemple l'os malaire. C'est pour cette raison qu'il est plus difficile de comparer notre article avec d'autres. Il s'agit donc, à notre connaissance, d'une première étude des cas de traumatologie maxillo-faciale au Québec. Δ

Les demandes de tirés à part doivent être adressées à :
D^r F. Blondeau, Hôpital Christ-Roi,
300, boul. Hamel, Québec, Qc., G1M 2R9.

Références

1. Ellis, E., El-Attar, A., Moos, K.F.: An analysis of 2067 cases of zygomatico-orbital fracture. *J Oral Maxillofac Surg* 43:417-428, 1985.
2. Finlay, P.M., Ward-Booth, R.P., Moos, K.F.: Morbidity associated with the use of antral packs and external pins in the treatment of unstable fractures of the zygomatic complex. *British Journal of Oral Surg* 22:18, 1984.
3. Bradley, P.F.: *Essential surgical practice*. Ed. A. Cushieri: Wright 1988, 389-406 (405).
4. Zuidema, G.D., Rutherford, R.B., Ballinger, W.F.: *The management of trauma*. Philadelphia, WB Saunders, 1979, 310.
5. Sandor, G.K.B., Collins, F.J.V.: *Analysis of compression plating of mandibular fractures*. *JCDA* 6:483-486, 1987.
6. Brown, J., Barnard, D.: The trans-nasal kirschner wire as a method of fixation of the unstable fracture of the zygomatic complex. *British Journal of Oral Surgery* 21, 208-213, 1983.
7. Carroll, M.J., Hill, C.M., Mason, D.A.: Facial fractures in children. *Oral Health*, vol. 78, no. 1, 1988, 15-18.

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Infant feeding practices and occlusal outcomes: A longitudinal study

D. W. Davis, D.D.S., D.D.P.H.
P.A. Bell, M.Sc., R.D.N.
Vancouver

ABSTRACT

This study was undertaken to determine the relationship between infant feeding and occlusal outcomes. One hundred eight subjects born in 1983, whose mothers participated in the survey of infant feeding, took part in the 1988 survey of oral-health. A strong association (chi-square = 7.47; $p = 0.006$) was found between exclusive bottle-feeding and anteroposterior malocclusion.

SOMMAIRE

On a entrepris cette étude pour déterminer s'il y a un rapport entre l'allaitement et l'occlusion. Effectuée en 1988, l'étude a porté sur 108 enfants nés en 1983 dont les mères avaient répondu à un questionnaire sur la façon de les allaiter. On a découvert un rapport très étroit ($\chi^2 = 7.47$; $p = 0.006$) entre l'allaitement exclusivement au biberon et la malocclusion antéro-postérieure.

It has long been suggested that bottle-feeding and malocclusion are linked in a causal relationship.^{1,2} This study is the first to document individual infant feeding practices and to follow up several years later with direct examination of oral-health outcomes. This methodology has made it possible to measure the strength of the association between feeding experiences in the first year of life and subsequent occlusal outcomes. It has permitted a determination of the relative risk for developing malocclusion for each feeding method.

Method

In 1982, the Medical Services Branch, Health and Welfare Canada, implemented a national database on breast-feeding³ in cooperation with native organizations across the country. One of the three components of this program was a longitudinal survey of the method of feeding from birth to six months of all Indian and Inuit babies born in 1983 who received services from Medical Services Branch.

Seventy-five British Columbia First Nations communities participated in the



infant feeding survey. There were 670 live births reported in these communities. The participation rate in the survey was 86 per cent at birth (575); 83 per cent at three months (555) and 72 per cent at six months (483).

An infant feeding survey form was used to collect information — as reported by each mother — on mother's age, parity, baby's birth weight and ethnicity. Feeding methods from birth were documented during post-natal visits and monthly well-baby visits. At each visit it was noted whether the baby was exclusively breast-fed, breast-fed and bottle-fed in combination or exclusively bottle-fed. The age at which solid foods were introduced was also recorded.

In 1988 the fifth quadrennial Oral Health Survey of First Nations Children in British Columbia was carried out by the dental staff of Medical Services Branch. Among the children examined in this province-wide survey were 263 children born in 1983. The orthodontic variables included in the survey (see Table II) were molar relationship (A = normal, B = distocclusion and C = mesiocclusion); cuspid relationship (A = normal and B = lower cuspid posterior to upper); crowding (A = no space discrepancy, B = one or two teeth severely rotated or displaced more than .5 crown width and C = three or more teeth); drifting from premature loss (A = none, B = one or two teeth in one arch and C = three or more); crossbites

(A = absent, B = one or two teeth in one arch and C = three or more); overjet (A = normal, B = + 4-7 mm, C = greater than 7 mm and D = underjet); overbite (A = normal, B = 4 mm without trauma, C = with trauma and D = openbite); other manifestations of malocclusion (A = no and B = yes); congenital malformations (A = no, B = minor and C = major); and appliance use (A = no, B = passive and C = active).

Since both the survey of infant feeding practices and the oral health survey included children born in 1983, it was decided to examine the two databases for matching subjects and to analyse the findings to test the strength of association between feeding experience during the first year of life and occlusal outcomes in 1988 when the children had fully-developed deciduous dentitions.

The significance of early signs of malocclusion is largely unresearched. According to Moyers⁴, studies addressing this question have been limited by being retrospective. While it is our belief, based on clinical observations, that excessive overjet in the primary teeth is not self-correcting and precedes an excessive overjet in the permanent dentition, this remains to be demonstrated in a prospective study.

TABLE I

Description of the Study Population

	Number in sample	Weighted (%)
n	108	100.0
Age at exam		
51-60 months	56	51.9
61-70 months	52	48.1
Gender		
Female	57	52.8
Male	51	47.2
Feeding		
Breast only	28	25.9
Bottle only	49	45.4
Both	31	28.7

The 575 infant nutrition forms completed at birth in 1983 were compared with the 263 oral health survey forms completed in 1988 for children born in 1983, and there

were 108 certain matches. These subjects came from 37 communities throughout the province. The range of community sample sizes was one to 14 at the following frequencies: 18 communities $\times$ one sample, 5×2 , 3×3 , 2×4 , 3×5 , 2×6 , 2×7 , 1×8 and 1×14 . The average community sample size was 4.1 children.

The mean feeding study time for the 108 subjects was 6.12 months (Standard Deviation (S.D.) = 1.37). Eight infants participated for less than six months and 11 for longer than six months. At the time of the oral health survey, the same 108 subjects ranged in age from 51 to 70 months. While they were all born in 1983 and were surveyed during the 1988 calendar year, there was a potential age span of 24 months between those born in December but examined early in the year, and those born early in the year but examined late in 1983. The mean age of the children examined in 1988 was 60.13 months (S.D. = 4.65).

Analysis

A unified database was created for each of the 108 subjects using a dBase software program. Each record comprised 40 fields including all dental and nutritional variables described earlier. The Epi Info, Version 5, statistics system developed for the Centers for Disease Control in Atlanta and the World Health Organization⁵ was then used to complete the data analysis

TABLE II
Frequency Distribution of Occlusal Variables For 108 Children

	Normal	Abnormal		
	A	B	C	D
Molar relationship	100	3	5	*
Cuspid relationship	107	1	*	*
Crowding	107	1	—	*
Drifting	107	—	1	*
Crossbite	96	8	4	*
Overjet	95	8	2	3
Overbite	92	7	—	9
Malocclusion	105	3	*	*
Congenital	103	5	—	*
Appliance	107	1	—	*

* not applicable

and to perform the required statistical calculations.

The frequency distribution for the 10 occlusal variables was tabulated for the 108 children. The distribution was documented by severity as described in the methodology: A indicates normality; B and

C indicate moderate and severe occlusal abnormalities; D, where it applies, is a qualitative variant of abnormality.

The Kruskal-Wallis One Way Analysis of Variance⁶ was used to test for differences in each of the 10 occlusal variables between those children who were breast-fed and those who were never breast-fed. Two-dimensional cross-tabulations were performed on method of feeding (exposure) versus occlusal variable (disease) for every combination for which sufficient abnormalities were observed to warrant analysis. In each case the relative risk was calculated and a chi-square analysis was performed.

Results

Of the 10 occlusal variables employed in oral health methodology, four abnormalities were sufficiently prevalent to warrant further analytical scrutiny: abnormal overbite (16), abnormal overjet (13), crossbites (12) and abnormal molar relationships (8).

The Kruskal-Wallis One Way Analysis of Variance showed no significant variation in occlusal outcomes as a result of feeding method except for overjet ($p = 0.05$).

A two-dimensional cross-tabulation of overjet (disease) and bottle feeding (exposure) showed that 11 of the 49 bottle-fed children had abnormal overjets. All but two of the 59 children who were exclusively or partially breast-fed had normal overjets at examination in 1988. The relative risk (RR) of developing an abnormal overjet following exclusive bottle-feeding is 6.62 ($1.54 < RR < 28.47$). The chi-square test of association (Yates corrected) was 7.47 ($p = 0.006$).

Conclusions

In spite of the use of a screening approach which employed relatively crude orthodontic parameters, it was possible to demonstrate a highly significant association between exclusive bottle-feeding and malrelationship of the teeth in the anteroposterior plane. The data were in no way influenced by expectations of the examiners, who had no knowledge of feeding histories and no way of knowing that the dental examinations would later be compared with feeding histories.

Anteroposterior malocclusions constitute 72 per cent of all malocclusions seen in First Nations adolescents (218 of the 381 most recently reviewed cases). Because the anteroposterior relationship of the primary dentition is affected by infant feeding, and this malrelationship does not diminish as the child grows from the primary dentition to permanent, it can be stated with confidence that exclusive bottle-feeding is an important causative environmental factor.

This study demonstrates that breast-feeding lowers the risk of anteroposterior malrelationships. In the absence of a demonstrated dose relationship between bottle-feeding and malocclusion, one is led to hypothesize that breast-feeding leads to normal mandibular growth and occlusal relations even where infants are partially bottle-fed. As additional records are added to the database, it will be possible to test this hypothesis. Δ

Acknowledgements

We are grateful to the families who participated in these projects and to the community care givers in the Pacific Region. Together they have shed new light on the etiology of malocclusion.

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Ms. Bell is the Regional Nutritionist.

Reprint requests to **Dr. Davis**.

References

1. Meyers, A. and Hertzberg, J. Bottle-feeding and malocclusion: Is there an association? *Am J Orthodont Dentofac Orthop* 93:149-152, 1988.
2. Labbok, M.H. and Hendershot, G.E. Does breast-feeding protect against malocclusion?: An analysis of the 1981 child health supplement to the national health interview survey. *Am J Prev Med* 3(4):227-232, 1987.
3. Stewart, P.J. National database on breast-feeding among Indian and Inuit women: Survey of infant feeding practices. Health and Welfare Canada, 1985.
4. Moyers, R.E. Handbook of Orthodontics, Ed. 4. Chicago, Year Book Medical Publishers, 1988.
5. Dean, A.G., Dean, J.A., Burton, A.H. et al. Epi Info, Version 5: a word processing, database and statistics program for epidemiology on microcomputers. USD, Incorporated, Stone Mountain, Georgia, 1990.
6. Shott, S. Statistics for Health Professionals. Toronto, Saunders, 1990.

FIRST AID TIP

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- Direct Pressure to stop blood flow
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- Rest to slow the circulation. Apply direct pressure with the hand over a dressing if available. If the dressing becomes blood-soaked, do not remove it; add another and continue pressure. When bleeding is controlled, maintain pressure and secure dressings with bandages. Maintain elevation and immobilize the injured limb.



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Winnipeg, MB R2M 3R4

November 23, 1991
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New Brunswick Dental Society
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October/Octobre 1991

October 2-5: American Academy of Periodontology.
Contact: Barbara Meuller Connell, 211 E Chicago Ave,
Suite 1400, Chicago, IL 60611, USA. (312) 787-5518.

October 3-5: American Academy of Gold Foil
Operators in Vancouver, BC. Contact: Dr. T.E. Ramage
(604) 873-5191.

October 4: 5th Annual Bernard Jankelson Memorial
Lecture in Seattle, WA. For details contact: ICCMO Inter-
national Headquarters, 830 Marsh & McLennan Bldg,
Seattle WA 98101. Tel: (206) 623-8418.

October 7-13: Fédération Dentaire Internationale in
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Canadian Dental Association, 1815 Alta Vista Dr, Ottawa,
Ont. K1G 3Y6 (613) 523-1770.

October 9-13: American Society of Dentistry for
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Suite 1430, Chicago, IL 60611, USA. (312) 943-1244.

October 26-28: 17th General Meeting of the Japanese
Association for Dental Science in Osaka. Contact: Japan
Dental Association, 4-1-20 Kudan-kita, Chiyoda-ku,
Tokyo 102, Japan.

November/Novembre 1991

November 27-30: XIIth International Dental Film and
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1991. Enquiries: Dr. M. Dolovici, XIIèmes Journées 1991,
92 av. de Wagram, Paris, France. 33 1 42.27.89.00.

November 30-December 5: Greater New York Dental
Meeting in New York City. For details, contact: Greater
New York Dental Meeting, 1700 Broadway, 4th floor,
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August 2-4: 7th Annual ACOI Symposium in Dearborn,
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Congress of Oral Implantologists, 248 Lorraine Ave,
Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300.

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(312) 664-2122.

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September 7-8: 7th International Congress of Inter-
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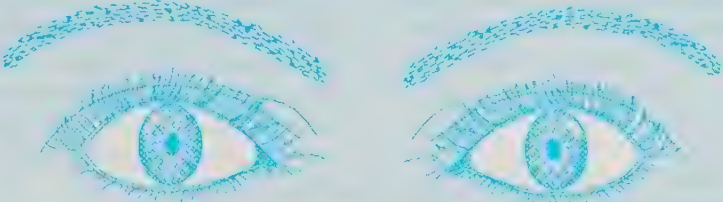
September 12-15: International Association for
Orthodontics. Contact: Joanna Carey, 211 E Chicago
Ave, Suite 915, Chicago, IL 60611, USA. (312)
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September 25-29: American Association of Oral &
Maxillofacial Surgeons in Chicago. Contact: Lisa Sykes,
9700 W Bryn Mawr Ave, Rosemont, IL 60018, USA.
(708) 678-6200.

September 26-28: 3rd Asian Academy of Cranioman-
dibular Disorders in Singapore. Contact: Asian Academy
of Craniomandibular Disorders, c/o 268 Orchard Rd,
5th floor, Singapore 0923. Fax: (65) 7321979.

September 27-30, 1991: 13th Congress of the Inter-
national Association of Dentistry for Children, Kyoto,
Japan. For information contact the Secretariat, 13th Con-
gress of the International Association of Dentistry for
Children, c/o Japan Convention Services, Inc., Sumitomo
Seimei Midotsuji Bldg., 4-14-3, Nishitemma, Kita-ku,
Osaka 530, Japan.

September 29-30: American Board of Oral and
Maxillofacial Radiology 1991 Certifying Exam in
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A LESSON FROM "60 MINUTES"

I would like to comment on the editorial that appeared in the February 1991 issue of the *CDA Journal*.

There is no doubt that the "60 Minutes" segment on amalgam engendered almost hysterical alarm in the public mind, and that our profession did what it could to quell the public's somewhat irrational reaction. However, to be realistic, the publication of pro-amalgam comments in various dental publications, or having CDA representatives speak to concerned patients, can only reach a minuscule number of people. The "60 Minutes" program, on the other hand, has an average audience of 50 million. We cannot hope to overcome this gigantic discrepancy in exposure. But we can, should and must learn from the amalgam experience. Let me outline what I perceive to be our present failings.

1. The profession does not understand the media. It fails to appreciate that the role of the media today is not only to present the news, but to make it either entertaining, controversial, or both. When the media is unable to fulfill this role, the public turns the dial, buys a different paper or changes channels.
2. The profession must realize that what counts where television is concerned is not what the public actually sees and hears, but what it *perceives* itself to see and *thinks* it hears. Until we understand this, our profession will always be subject to misinterpretation and, worse, to loss of credibility. In my opinion, this was clearly evident in the "60 Minutes" segment on amalgam. Although the ADA spokesperson stated the facts clearly and accurately, his demeanor — while professional and courteous — left an impression of obfuscation. Sad to say that he also made one very damaging statement.

It is therefore of paramount importance that the profession select its spokesmen based on the understanding those individuals have of how the media works, and on their ability to project the necessary image. We can no longer choose these people on the basis of what office they hold.

Chaplin became one of the world's best loved comics without uttering a word. The heart throbs of the silent film era projected charisma, and induced adulation, without clever dialogue. This is not to denigrate the fact that what we say is important, nor that the person saying it must have a thorough understanding of his subject matter. However, in spite of everything, we are always at a serious disadvantage vis-à-vis the media, especially



Malcolm Yasny, D.D.S., M.Sc.

when it comes to investigative-type programs. We may know precisely what we should answer in response to selected questions. However, we don't know who else, if anyone, will also be interviewed, nor what these people will say, and, most important, we have no control over how the entire show will be edited.

We thus are left with two choices.

1. Refuse all requests for interviews. This, obviously, would not be in our best interests, as we would then have absolutely no way to present our viewpoint. Of course, we could choose to avoid TV interviews and limit our exposure to radio and newspaper, where the spoken or written word does not become diluted or shaded by visual impact.
2. Find an individual who understands the media, who has had radio and TV exposure — and is thus no longer intimidated by interviewers, cameras or microphones — who is able to project the professional image we want, and who has the necessary instincts. If no one fits this niche, then enlist expert help to train such a person or persons. Thus, when an interview opportunity arises, we need only telephone our resident expert and tell him which station wants him to go on air.

Your statement that "Ratings bring advertisers and advertisers bring money: that's the bottom line," only serves to strengthen the arguments presented in this letter. To ask for "equal responsibility from those involved in the dissemination of news" is idealistic but unrealistic. The two quotes I have cited above are, in my view, incompatible with one another.

It is of no use to state that a program has been one-sided, nor that facts were distorted, etc. This may well have been the case, but what benefit accrues to us by complaining? None — because, unfortunately, it is the media that owns the lines of communication to the public. That is a reality we cannot ignore. What we must do is to focus our attention on forging a small but capable group of dental spokesmen, people able to stand in the media's arena, parry their spurious statements and make the public see and hear what we wish them to see and hear. But again, it's the same story as in every facet of life — you need the right tools to get the job done.

Malcolm Yasny, DDS, MSc.

(Dr. Yasny conducts a private practice in orthodontics in Toronto and writes a weekly column "Your Teeth" in the *Toronto Star*. He currently serves as President of the Canadian Association of Orthodontics.)

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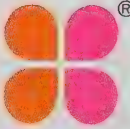
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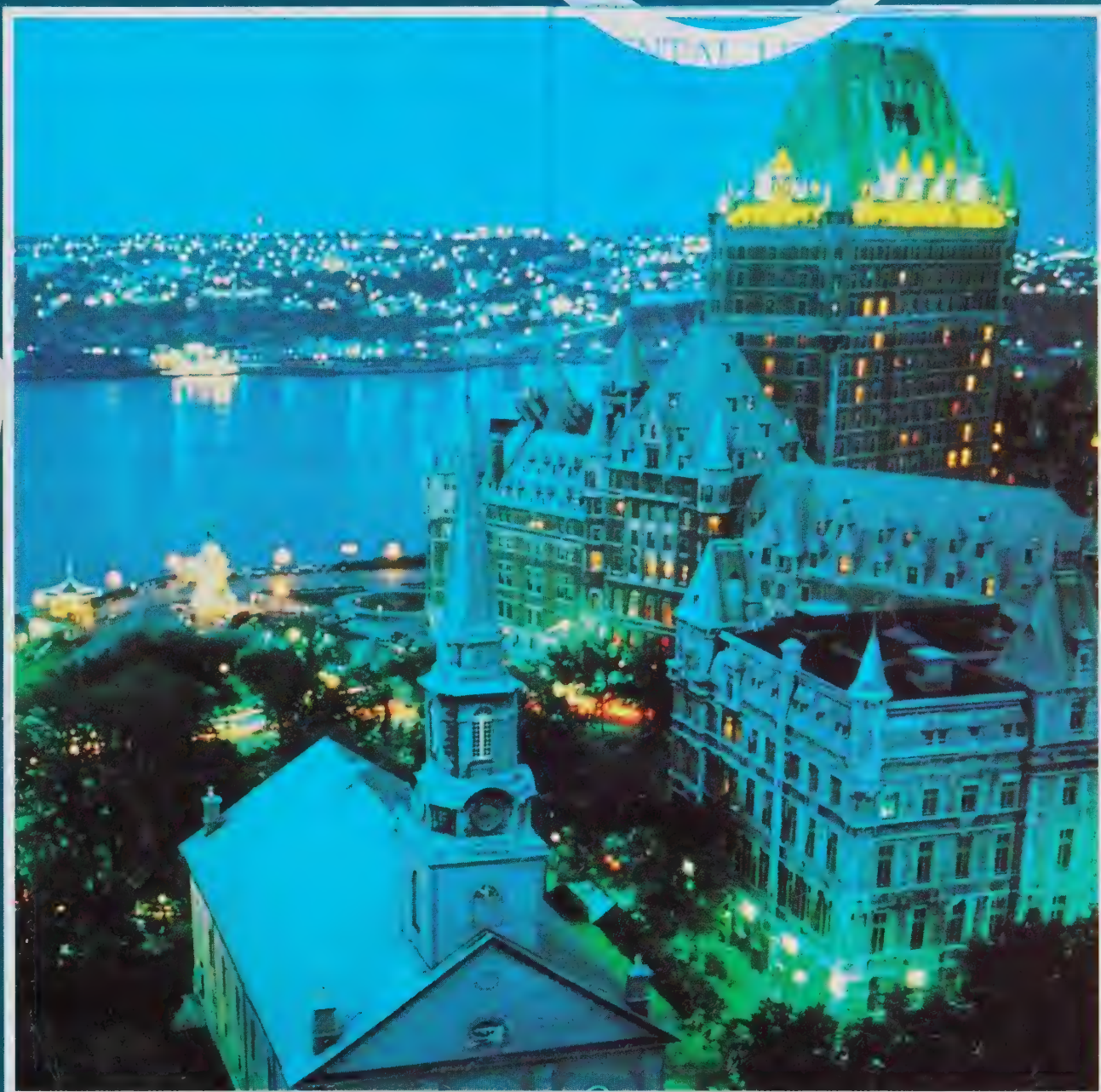
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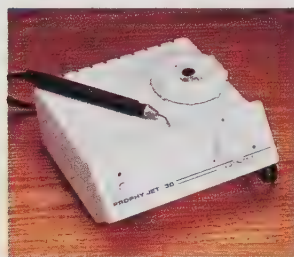


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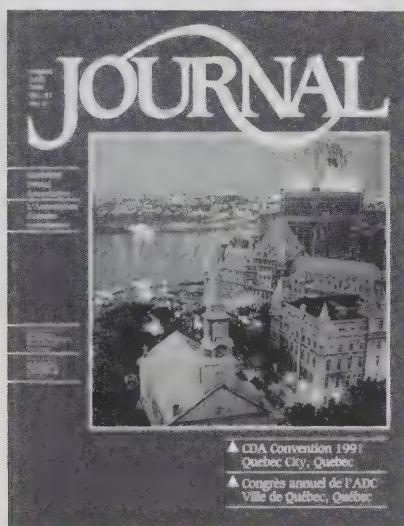
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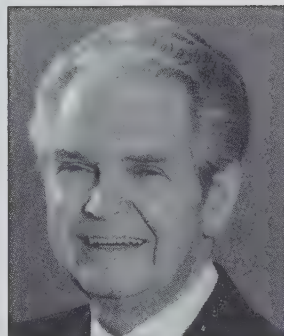
Sir Winston Churchill, the prime minister of Great Britain for most of the Second World War, once quipped, “Parliamentary democracy is the worst form of government, except for all others.” Today, when we look at Canada and the other countries of the world, we can only answer, ‘How right he was.’

Things are certainly not perfect in Canada, but then where on this planet are they? Despite the collapse of the Meech Lake Accord, the crisis at Oka, the Goods and Services Tax, Canada's huge deficit, the trend to cross-border shopping, the recession and a myriad of other problems, are we not living in the best country in the world? Or at least the second best, according to a recent United Nations ranking of the countries offering the greatest quality of life. (Japan was first.)

A friend of ours has expressed delight with the United Nations' tabulation. For years he has been telling his friends that he has “leased” a 747 jet plane, which is parked on the tarmac ready for a weekly embarkation of Canada's dissidents. He offers a free one-way ticket to every Canadian complainer, whiner and malingerer who feels there is a better country in which to live.

Nor is the microcosm of Canadian dentistry much different than the total country. For two days, August 23 and 24, 1991, the dentists' equivalent of Parliament — the CDA board of governors — will meet and deliberate our past, present and future. The debates and resolutions will not always be to everyone's liking, but when the alternatives are considered we are back to “except for all others.”

The 29 board members — elected on the basis of representation by population — will speak for more than 16,000 Canadian dentists. They will deal with more than 75 separate agenda items emanating from 17 committees and three councils. The reports and recommendations of these committees and councils will have been developed through the volunteer labor of over 125 dentists from coast-to-coast, men and women who are our neighbors and associates.



Dr. P. Ralph Crawford

The board of governors will hear from 10 provincial associations and licensing authorities, nine specialty sections, 10 dental faculties, the Armed Forces, the hygienists, dental assistants and 12 other affiliated and government organizations. Those 29 elected board members, as they make decisions and allocate the CDA's \$5-million budget, will in some manner influence the oral health care of millions of Canadians.

Undoubtedly, some of the board's decisions will be unpopular — no democracy pleases all of the people all of the time. Whining and complaining in the background has never achieved very satisfactory results, however. If a decision taken by the CDA board or any function of your national association is not to your liking, do the democratic thing. Contact your CDA representative, call a CDA official, or seek out a committee member. Make him or her aware of your concerns and the reasons behind them. The vehicle you use to register your complaint is not important — your involvement in the decision-making process and your understanding of how it works and how you can participate in it are what counts.

Some years ago, a dentist was showing a confrere from a communist country through one of our provincial legislatures. The debate of the day was heating up and the decorum of the elected members was not of the highest calibre. When the Canadian dentist attempted to apologize to his visitor for the antics of the legislators, the Eastern-European dentist gently said, “Do not be too harsh or critical — have you considered the alternative.”

Consider the alternative to the Canadian Dental Association and its board of governors, which for 90 years has been deliberating, debating and decreeing the dental future of our citizens. There is no worthy alternative. Dental democracy is the worst form of governing Canadian dentistry — except for all others.

P. Ralph Crawford, BA, DMD

Editor: Journal of the Canadian Dental Association



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President's Column

A FOND FAREWELL

Writing these words, I was struck by the realization that my term as CDA's president was nearly complete. I had chaired my last executive council meeting; this would be my last "President's Column."

Like every other CDA president, I had known from the start that my term would last for only a year. But until I laid down the gavel at the end of the June executive council meeting, and grasped my pen to write this column, I had never actually thought about it coming to an end.

A feeling of sadness flooded over me as I contemplated the future. I had enjoyed every minute of my term as CDA president — with a few minor exceptions. It was a great year, one that will be in my thoughts for a long, long time. Now it was ending.

But I had to face reality. The fact that I would soon be passing the chain of office to a new president did not mean that I would be leaving CDA. Far from it. As a practising dentist, I could and would remain a part of the association, and there would still be a role for me to play in organized dentistry. My sadness vanished as quickly as it had appeared.

As CDA's president, I have tried, through this column, to convey to you my thoughts and feelings on organized dentistry. I have done my best to explain how, as a national organization, CDA makes decisions on your behalf. And, on other occasions, I have attempted to discuss some of the issues facing our profession.

I hope that I succeeded. I believe that it is essential for organized dentistry to face the issues that confront it head-on. It is pointless to try to skirt around them. In most cases this latter approach not only fails to resolve an issue or problem, but it is also viewed in a negative light by the public.

One of the most important issues confronting the dental profession today concerns the process by which Canadian dentists are certified to practise. It is my sincere hope that the upcoming Symposium on Certification, to be held in Quebec City August 25, will lead to an open and frank discussion of this issue.

Organized by the licensing bodies, the symposium will look at the certification issue from every possible angle. If it is to be successful, however, the various corporate bodies involved with the certification process will have to come to the symposium with open minds and a willingness to compromise — not with the goal of protecting their own interests.

Despite my normally optimistic outlook on the future of dentistry, I am not at all confident the symposium will produce an optimal solution. And this would be unfortunate because organized dentistry must reach a consensus on the certification issue soon if it to enhance the future of its education and licensure system. The forum in which this objective can be attained is now in place; it's up to all of us to use it to advantage.

Whatever happens to the certification issue, you should be proud of what your national organization has accomplished this year. We have a strong team in place, supported by an extremely talented and dedicated senior staff.



Gilles Dubé

CDA's new communications strategy has drawn rave reviews from our members, a fact that reflects the success we have enjoyed in handling a number of extremely sensitive issues. Our quick, timely response to the concerns expressed by the public over the health risks it associated with the presence of mercury in dental amalgam is a case in point.

We also initiated successful strategies to deal with the Goods and Services Tax which, in its original form, would have had a devastating impact on the average dentist.

CDA's conference on the implications of HIV for the health-care worker was another outstanding achievement. From it CDA developed the seven-point plan for infection control in the dental office (published in the April/May 1991 issue of *Communiqué*).

As the president of CDA, I was pleased to have played a part in each of the many successes the association has enjoyed this year. But my role has usually been a minor one. Our accomplishments have come about as the result of a team effort, with each member of the team taking a share of the load. The esprit de corps that is so evident throughout the association has been a source of inspiration to me. It is one of the reasons that I have been so proud to be your leader.

Strangely enough, it was never one of my basic goals to become the president of CDA. I joined the association to work for the long-term health of the dental profession, a decision I have never regretted. Being your president was an added bonus, and it is one that has given me a great deal of satisfaction.

But, having in effect become the president of CDA more by chance than design, I believe it is fair to say that any dentist committed to the good of the profession could lead our national organization.

Any dentist willing to work hard, who is able to dedicate a lot of his or her time to the dental profession, who can promise to work toward providing better oral health care to the public, and to work for the betterment of the dental profession on behalf of his or her confreres, can succeed in this role.

With the help of a line borrowed from a TV commercial, I want to say to all my fellow dentists, "Don't spend years thinking about becoming active in CDA, or even about taking on the top job, "Just Do It." "

That said, I would like to express my sincere thanks to all of you for having given me the opportunity to serve. It has been a challenging, rewarding year and one that I have truly enjoyed. As for the future, I plan to stay actively involved in organized dentistry. Where and in what capacity remains to be seen.

My immediate task is to welcome Dr. Les Allen as the next leader of the Canadian Dental Association. Good luck Les, I know you will be an outstanding president and I wish you well as you assume the chain of office.

Gilles Dubé, DMD, M.Sc., Admin. Santé
President of the Canadian Dental Association

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Health Protection Branch Issues Second Alert

The Operations and Compliance Division of the Health Protection Branch, Health and Welfare Canada, has issued a second alert — the first was published in the April 1991 issue of the *CDA Journal* — regarding the Vitek Temporomandibular Joint and Interpositional Implants, all lots.

Manufactured by **Vitek Inc.** of Houston, Texas, the devices were imported into Canada by **Instrumentarium**, a Terrebonne, Quebec-based company. Both have been associated with fragmentation and/or a foreign body response. Health Protection Branch has therefore requested that the following U.S. Food and Drug Administration (FDA) alert be published for patient safety.

FDA Safety Alert

Serious problems with Proplast®-coated TMJ implant

To Oral and Maxillofacial Surgeons:

This is to urge you to reexamine all of your patients who have received temporomandibular joint (TMJ) interpositional implants which were manufactured or marketed by either Vitek Inc. or Oral Surgery Marketing, Inc. (both of Houston, Texas). These implants were distributed between February 1983 and June 1988 and were the subject of Vitek's March 23, 1990, safety alert. The patent for this medical device is currently held by Hadaco, Ltd. (British Virgin Islands). Any remaining implants *should not be used* and should be returned to:

Bonharn, Carrington and Fox
Bankruptcy Trustee for Vitek, Inc.
400 One Shell Plaza
Houston, Texas 77002
Attention: Mr. Ben Floyd

Problem

These implants, all of which are made of Proplast® (Teflon®-carbon or Teflon®-aluminum oxide fibre composite), have been associated with implant perforation, fragmentation and/or a foreign body response which may result in progressive bone degeneration of the mandibular condyle and/or the glenoid fossa.¹⁻³ If bone degeneration continues unchecked, patients may experience intense pain and severely limited joint function. One study found that all patients with Proplast®-coated TMJ interpositional implants who

experienced complications demonstrated progressive bone degeneration in as little as one to two years.¹ In a second study, implant failure and bone degeneration occurred in both symptomatic and asymptomatic patients.²

Recommendations

Because asymptomatic patients may experience bone degeneration, FDA recommends that all patients with these implants who have not had a radiograph taken in the past six months undergo *immediate and appropriate radiographic examination*. The examination will assist in determining if loss of implant integrity has occurred or if progressive bone degeneration is occurring.

- If loss of implant integrity or progressive bone degeneration is not occurring, regular radiographic examinations of the implant should be performed every six months for as long as it remains in the jaw.
- If either loss of implant integrity or progressive bone degeneration is found, explantation may be appropriate. If explantation is chosen, patients should be evaluated to determine what alternative procedures might be appropriate, e.g., a non-Proplast® coated implant, an autologous bone graft, or no replacement (symptomatic management).

Practitioners who have questions concerning the alert, should contact: Gregory Singleton, DDS, Center for Devices and Radiological Health, Food and Drug Administration, 1390 Piccard Drive, HFZ-250, Rockville, Maryland 20850. Δ

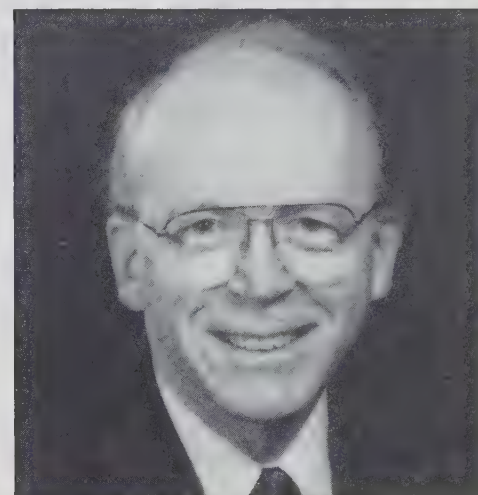
References

1. Primely, Donald, Jr. Histological and Radiographic Evaluation of the Proplast-Teflon Interpositional Implant in Temporomandibular Joint Reconstruction Following Meniscectomy. Thesis, Masters Degree in Oral Maxillofacial Surgery, May 1987. University of Iowa.
2. Westlund, Kurt J. An Evaluation Using Com-

puterized Tomography of Clinically Asymptomatic Patients Following Meniscectomy and Temporomandibular Joint Reconstruction Using the Proplast-Teflon Interpositional Implant. Thesis, Masters Degree in Oral and Maxillofacial Surgery, May 1989. University of Iowa.

3. Wagner, J.D., and Mosby, E.L. Assessment of Proplast-Teflon Disc Replacements. *J Oral Max Surg* 48:1140-1144, 1990.

Toronto Dentist Receives Service Award



Dr. R. Bruce Ross

Dr. R. Bruce Ross, a Toronto orthodontist and a professor with the faculty of dentistry at the University of Toronto, was the recent recipient of the American Cleft Palate-Craniofacial Association (ACPA)'s Distinguished Service Award. The award is presented annually to an individual who has demonstrated exceptional service and contribution to ACPA through activities which have fostered greater public or professional knowledge. Dr. Ross is the only Canadian to have received this award.

A graduate of Dalhousie University, Dr. Ross is the president of Aboutface, a family support group for the facially disfigured. He is the former chief of dentistry and head of the division of orthodontics at the Hospital For Sick Children in Toronto, and the former director of the institution's Craniofacial Treatment and Research Centre. In addition, he is a past president of both the Ontario Association of Orthodontics and the Canadian Craniofacial Society.

Dr. Ross will also receive the Canadian Association of Orthodontists' Distinguished Service Award this year. It will be presented to him during the association's annual meeting in Quebec City this August. Δ

Erratum

In the article entitled "A study of the reasons for tooth extractions in a Canadian population sample," which appeared in the June 1991 issue of the *Journal*, the Review of the Literature section was inadvertently placed between the Method and the Results sections. The Review of the Literature section should have preceded the Method section. The *Journal* regrets the error.

Three Prominent Dentists Seek CDA Vice-Presidency

Three members of the CDA executive council have been nominated for the position of CDA vice-president for the 1991-92 term. Elections will take place at the board of governors annual meeting on August 24, 1991. The vice-president assumes a role on the CDA management committee and will become the president-elect the following year.



Dr Bryun Sigfstead

Dr. Bryun Sigfstead received his DDS degree in 1967 from the University of Alberta and a certificate in orthodontics from the same university in 1973. He is in private practice in Edmonton. Dr. Sigfstead was president of the Alberta Dental Association in 1984-85 and has been a member of the CDA executive council since 1987.



Dr Ronald Smith

Dr. Ronald G. Smith received his dental degree from the University of Alberta



Dr Raymond Wenn

in 1974 and is in general practice in Duncan, B.C. He is a past president of the College of Dental Surgeons of British Columbia and first represented his province on the CDA board of governors in 1987. He has been a member of the association's executive council since 1989.

Dr. Raymond Wenn received his dental degree from Dalhousie University in Halifax in 1975 and is in general practice in the city of his birth, Charlottetown, P.E.I. President of the Dental Association of Prince Edward Island in 1984-85, he first assumed a seat on the CDA board of governors in 1986 and advanced on to the CDA executive council in 1987. Δ

Former CDA Editor Speaks to Bahamian Dentists



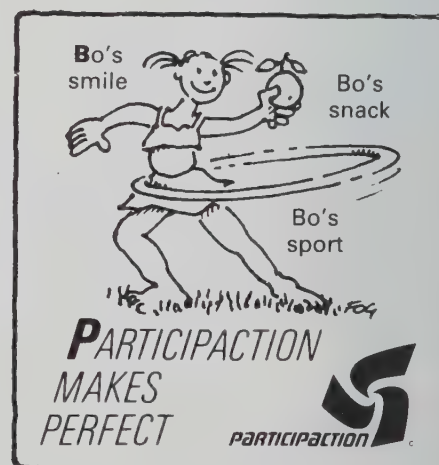
Prominent BIDA members gather with former CDA associate editor, Clarence Metcalfe. From left to right: Dr. Sparkman S. Ferguson, treasurer; Dr. Gill Gibson, past-president; Mr. Metcalfe; Dr. Joyous Pickstock, president; Dr. Kendal Major, periodontist; and Dr. Arthur A. Rashad, oral surgeon.

Clarence Metcalfe, a former associate editor of the *Journal of the Canadian Dental Association*, was the guest speaker at a meeting of the Bahamas Islands Dental Association (BIDA) last March.

Mr. Metcalfe was invited to attend the meeting, held in Nassau, by Dr. Hal Leyland, a graduate of the University of Toronto, life member of CDA, and a founder, charter member and past president of BIDA. Supported by members of the BIDA executive, Dr. Leyland hoped Mr. Metcalfe's speech would provide the association's member dentists with some of the editorial guidance and inspiration needed to write articles for dental publications. BIDA plans to develop its own dental publication eventually.

In his address, "The Handpiece and the Pen," Mr. Metcalfe encouraged BIDA's member dentists to write about new experiences and discoveries within their practices, the opening of new practices and the

results of dental meetings, among other topics. He also told them that they should not hesitate to write letters to the editor regarding any published article or dental technique that appeared to be based on a faulty notion, theory or procedure. Δ



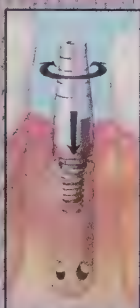


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CFDE 1991-92 Awards Total \$225,440

The Canadian Fund for Dental Education (CFDE) will bestow grants and awards for 1991-92 totaling \$225,440. The new funding, approved by the CFDE's board of trustees during its recent annual meeting, is being directed toward programs that will benefit dental education, awareness and research.

Recipients of CFDE grants and awards for 1991-92 include: the 10 Canadian faculties of dentistry, which (again) each received allocations for unrestricted grants of \$1,500 and undergraduate grants of \$2,000; the 1991 CDA Teaching Conference on "Problem Based Learning: Another Approach to Education" (\$10,000); the CDA Students Conference (\$11,000) and Dental Students' Table Clinics (\$10,000).

An innovative program called "Interactive Multimedia Courseware Development in Dentistry" will get \$6,740, while a workshop on "Maintaining Professional Competence: The Fundamentals," to be held in August 1991, was granted \$15,000.

Since 1986, CFDE has also supported the Association of Canadian Faculties of Dentistry (ACFD) Summer Teaching Institute. The program, which offers Canadian dental educators a nine-day course on practical teaching methods that can be applied in laboratories, seminars, clinics and lectures, was awarded \$43,000.

Another traditional grant will see \$15,000 in income from the Lorne E. MacLachlan Endowment Fund divided equally among the dental faculties at the universities of Toronto, Western Ontario, McGill and Dalhousie. The money will be used to benefit the schools' prosthodontics departments.

The Murray McDonald Memorial Lecture, an annual event that commemorates the life and work of Mr. McDonald, the former CFDE executive director, will also be sponsored again this year. Jeffrey Simpson, the well-known Canadian journalist and author, will be the featured speaker for the lecture, which will be held in conjunction with the CDA's August convention in Quebec City.

In addition, CFDE has allocated \$30,000 for a number of programs designed to increase public demand for dental health care. A total of \$10,000 went to three oral health fellowships — sponsored by Wrigley Canada Inc. — which were awarded to students researching the benefits of salivary stimulation in relation to chewing sugar-free gum. Four other awards, totaling



L.F.: M. Robert Dupont (PQ); Julie Hentschel, (Fund Administrator); Dr. Greg Baird (Atlantic Provinces); Dr. Bill Jharun (Alberta); Dr. Gordon Thompson (Dental Education), Mr. Arthur Zwingenberger (Dental Industry); 2nd Row L.: Dr. David Singer (Saskatchewan/Manitoba); Mr. Lee Maddison (Vice Chairman/Dental Industry); Dr. Donald O'Connor (Ontario); L.R.: Dr. Arnold Steinbart (British Columbia); Dr. Ted Ramage (Chairman).

\$3,500, were granted from the newly created George W. Barrett Memorial and the Nicholas A. Mancini Funds to assist undergraduate dental and dental hygiene students experiencing serious financial difficulty.

Allied Dental Health Professionals were allocated grants, in addition to CFDE fellowships, in the amount of \$2,200 for various programs throughout 1991. The board of trustees also provided \$29,000 for various teacher-training fellowship grants. A total of 20 applications from dentists and dental hygienists were considered. Six renewal applications and 10 new applicants were successful in obtaining funding for 1991/92.

Financing for the various grants and awards approved by CFDE is provided, for the most part, through the annual support the fund receives from individual dentists, associations, business and industry. For

1991-92, the board of trustees has approved an income forecast that predicts a substantial increase in these contributions.

The CFDE depends on the support of its loyal donors to provide dental researchers and educators with the levels of assistance they so vitally need to expand and continue their efforts to promote excellence in the dental profession. *It can't be done without your help!*

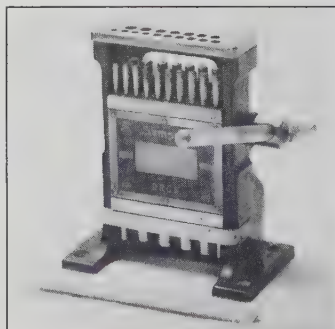
If you haven't already done so, please send your donation today. Be part of dentistry's future — it's your future too.

For further information, please contact the Canadian Fund for Dental Education, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6, or call 613-731-0493. Δ

**The fund issues tax receipts for all donations, and those of \$50 or more are recorded in the CFDE Annual Report and Honor Roll.

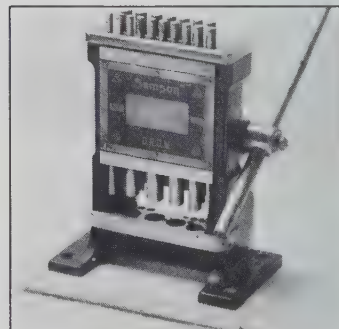
"WHAT'S IT?"

It is constructed of very heavy metal, has dimensions of approximately seven inches by nine inches, and is meant to be bolted to a bench. Movement of the handle drives plungers of varying sizes through upper and lower



holes, which are numbered. The emblem depicted on the four corners of the front plate is a diagram of three molars in a clover-leaf pattern and has the word 'Schulzmarke' inscribed below it.

(Write to Dr. Ralph Crawford, Journal Editor, 1815 Alta Vista Drive, Ottawa, Ontario, K1G 3Y6.)



AGD Executive Visits CDA

As part of its May 16, 1991, board of directors meeting in Ottawa, the executive of the Academy of General Dentistry (AGD) paid a visit to CDA's headquarters.

Following a tour of the newly renovated CDA offices, the AGD executive officers held informal discussions on areas of common interest with CDA's executive director, Mr. Jardine Neilson, and Mr. Brian Henderson, the director of professional services. Δ



AGD executive visits CDA headquarters: left to right, Dr. Ludwig Leibsohn, New York, AGD president-elect; Mr. Brian Henderson, CDA director of professional services; Dr. Henry W. Finger, New Jersey, AGD president; Dr. Harold E. Donnell, Jr., Chicago, AGD executive director; Dr. K. Gordon Chisholm, Vancouver, AGD director; Mr. Jardine Neilson, CDA executive director; and Dr. James Walsh, Perth, Ontario, AGD director.

CDA Retirement Savings Plan

Unit values: (Funds are valued weekly)

Fund	Unit values as at	
	June 30, 1991	May 31, 1991
Bond & Mortgage Fund	82.57314	83.13476
Common Stock Fund	16.89940	17.15895
Money Market Fund	56.54060	56.17419
Balanced Fund	32.25583	32.60375

G.I.C. Fund Term	*Interest rates as at	
	June 30, 1991	May 31, 1991
1 yr	8.85%	8.90%
2 yr	9.35%	9.35%
3 yr	9.35%	9.35%
4 yr	9.60%	9.40%
5 yr	10.10%	9.70%

(*rates subject to change without notice.)

Total Assets (Market value) of the Plan as of:

June 30, 1991	May 31, 1991
\$141,245,525.43	\$141,287,338.50

For further information:



Write:
CDSPI
Retirement Services Dept.
Suite 600
2 Lansing Square
Willowdale, Ontario
M2J 4Z3

or phone, toll-free:
Western and Atlantic Canada
and Ontario Area Code 807
only 1-800-268-5418
Quebec and Ontario, (except Area
Code 807) 1-800-268-3411
Metro Toronto Area . . . 497-7117
fax number: 1-416-497-9257

Obituaries/Nécrologie

Connor, R.A.: Dr. Connor graduated from the University of Toronto in 1933. He practised dentistry for seven years in St. Thomas, Ontario, before joining the Royal Canadian Dental Corps during the Second World War. In 1947 he pursued a career in public health dentistry and received his diploma in dental public health from the University of Toronto School of Hygiene in 1949. Dr. Connor served as chief of the dental health division of Health and Welfare Canada from 1963 until 1971. He was a member of the board of governors of the Canadian Dental Association and served as chairman of the dental section of the Canadian Public Health Association.

Cunningham, J.P.: Dr. Cunningham was a graduate of the University of Durham in 1963. He practised in Watrous and Saskatoon, Saskatchewan. Dr. Cunningham was a past member of the Council of the College of Dental Surgeons of Saskatchewan.

Ferguson, D.J.: Dr. Ferguson was born in Chatham, Ontario, in 1898. He graduated from the faculty of dentistry at the University of Toronto in 1919. He died on Sunday, April 21, 1991.

Lindskoog, T.G.: Dr. Lindskoog was a graduate of the faculty of dentistry at the University of Alberta in 1950. He practised in Edmonton from that time until 1975 when he retired. Dr. Lindskoog served as secretary and president of the Edmonton & District Dental Society.

Rumball, I.V.: Dr. Rumball graduated from the Royal College of Dental Surgeons in Toronto in 1924 and practised in Kingsville and Chatham, Ontario, until 1975. He retired after 51 years of dental practise and moved to Peterborough, Ontario, where he died May 24, 1991.

Taylor, L.V.: Dr. Taylor graduated from the faculty of dentistry at the University of Toronto in 1944. He was a life member of the Canadian Dental Association.

Wright, L.E.: Dr. Wright was born in 1946. She was a graduate of the faculty of dentistry at the University of Alberta in 1968.



STOP WRITING DIRTY NOTES



If you're using an average, everyday pen that promotes cross contamination, important

here's some information for you to chew on. Hu-Friedy has just designed the Pen-Probe™, the first sterilizable instrument to combine a pen and a probe.

This important breakthrough in instrument technology greatly improves your infection control procedures,

allowing you to finally write off a weak link in your asepsis chain. It also saves you the time you would have otherwise spent picking up an instrument, taking a measurement, putting down the instrument, picking up a pen, recording the measurement...

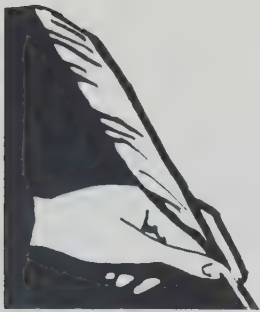
Hu-Friedy's new writing instrument is available as either the Pen-Probe, which comes in a wide selection of popular Hu-Friedy probe styles, or you can select the sterilizable pen without the probe.

This further ensures that you will never write another dirty note.



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Giving Science a Bad Name

I do not remember (nor do I very much care) whether it was G.K. Chesterton or George Bernard Shaw who wrote that "Science is the great superstition of the twentieth century"; but the letter of Dr. Edward Sheilds, published in the April issue of the *CDA Journal*, called this thought to mind.

I do not claim to have read all of the studies to which Dr. Sheilds refers, but I have read enough to establish a pattern. Typically, it goes something like this:

1. A number of patients having TMJ symptoms are divided into two groups and each group subdivided into two parts.
2. The patients in one group are treated, one part by coronoplasty (occlusal equilibration) and the other by the use of some sort of appliance. The patients in the other group are "treated" with placebo versions of the same modalities.
3. The results are tabulated and it is found that the rate of improvement is not significantly different between the two groups.

Based on this lack of variance, the conclusion is drawn that the patients' symptoms were psychogenic.

All that has really been proven, however, is that non-treatment was as effective as the treatment employed, or, to put it another way, that the treatment provided was not effective. The results do not prove that the patients' symptoms are psychogenic, any more than the fact that the cause of multiple sclerosis is not known proves that it is psychogenic.

This sort of reasoning gives science a bad name.

Dr. Ray Mulrooney
Don Mills, Ontario



Vision of Dentistry

I have just read the President's Column, "My Vision of Dentistry," published in the May issue of the *CDA Journal*. I would like to say that I think you are "right on." I feel good about CDA when I read items like this. I can see the association is in good hands.

John W.S. McMullen, BA, DDS
Fredericton, N.B.

I read the President's Column ("My Vision of Dentistry") in the *Journal* and it is the best one I have read in 50 years. I am 87 and have just written my memoirs for the University of Toronto. Your article was full of honesty, humanity, common sense and generally a feeling for the people you serve. More power to you and your splendid philosophy.

Stewart A. (Sandy) MacGregor, DDS
Toronto, Ontario.

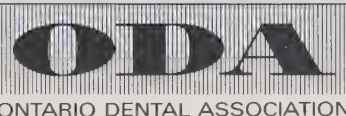


Consulting with specialists

CDA's president, Dr. Gilles Dubé, has received several letters concerning a comment he made in his May 1991 President's Column, "My Vision of Dentistry," specifically, "... It will be important to be closer to our patients, our staff and ourselves. We will have to meet most of our patients' needs and consult less with specialists."

"It is unfortunate," said Dr. Dubé, in response to these comments, "that I have offended some of our *Journal* readers — particularly the specialty groups. It was never my intent to suggest that general dentists deliberately avoid referrals to specialists."

"What I was attempting to say was that with increased years in practice, more experience and enhanced diagnostic abilities, the necessity to refer is often decreased. I could never imagine a time in my own dental practice when I wouldn't have full rapport, support and cooperation with the specialists." Δ



CLINICIANS WANTED!

Present a
MINI CLINIC or a TABLE CLINIC
at the

125th ODA Annual Spring Convention
May 14th and 15th, 1992 — Metro Toronto Convention Centre

A **MINI CLINIC** is a one hour presentation (special requests for longer presentations may be submitted) that may be scheduled between 9:00 a.m.–noon, or 2:00–5:00 p.m., Thursday, May 14th or Friday, May 15th, 1992. Please indicate your preference of day and time (i.e. morning or afternoon).

For these presentations we provide the following equipment — a maximum of two projectors, two screens, an electric pointer and flipchart. *If other equipment is required it must be provided by the clinician at his/her own expense.*

A **TABLE CLINIC** is a fifteen minute presentation that is repeated during a three hour period. These may be scheduled between 3:00–6:00 p.m. on Thursday, May 14th, and 10:00 a.m.–1:00 p.m., or 3:00–6:00 p.m. on Friday, May 15th. Please indicate your preference of day and time (i.e. morning or afternoon).

For these presentations we provide the following equipment — a carousel projector, screen, and an extension cord. *If other equipment is required it must be provided by the clinician at his/her own expense.*

Note: Ontario dentists and dental students wishing to present clinics are required to be ODA members in good standing. ODA membership requirement is not necessary for non-Ontario clinicians.

Deadline for Submissions: November 15th, 1991. Applicants will be advised regarding acceptance of their submissions by January 15th, 1992.

Contact Diana Thorneycroft at ODA Headquarters for an application form (please specify whether you are interested in presenting a mini or table clinic (or both!))

CDA Convention – Québec 1991



All of us at Infiniti are proud to support the coming National Convention of the Canadian Dental Association in Quebec City. We are especially pleased to have the opportunity of providing the services of our Q45 luxury performance sedan and G20 luxury sports sedan during these important meetings.

Both the Q45 and G20 have been received with critical acclaim. The European version of the G20, in a very short time, has garnered nine major awards in eight countries, while the Q45 was named best car in its class and one of the ten best cars in the world by *Road & Track* magazine. Naturally, we hope that you will take the opportunity to see and drive one of these outstanding automobiles during the convention. However, if that is not possible, we would like to bring the Infiniti experience to you in your home city.

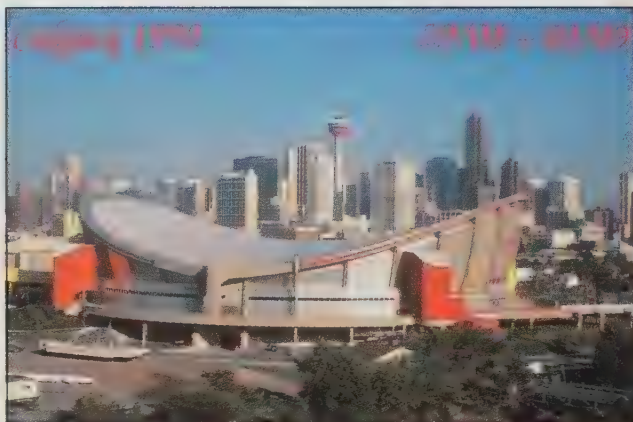
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Fred Bowyer
General Manager
Infiniti Division

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A LEGEND

One night, in ancient times, three horsemen were riding across a desert. As they crossed the dry bed of a river, out of the darkness a voice called, "Halt!" and they obeyed. The voice then told them to dismount, pick up a handful of pebbles, put the pebbles in their pockets and remount. The voice then said, "You have done as I commanded. Tomorrow at sun-up you will be both glad and sorry." Mystified, the horsemen rode on. When the sun rose they reached into their pockets and found

that a miracle had happened. The pebbles had been transformed into diamonds, rubies and other precious stones.

They remembered the warning and they were indeed both glad and sorry. Glad they had taken some, sorry they had not taken more. And this is the story of insurance.

Author unknown

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PROBLEMS AND PROCEDURES IN DENTOFACIAL ORTHOPEDICS

by Frans P.G.M. van der Linden

1990. Quintessence Publishing Co., Inc.,
London, U.K. 382 pages, B&W illustrations.

This is the fourth book in a six-book series written primarily for dental students and dentists. It presents a detailed description of dental arch development, with an emphasis on the transition from the primary to the permanent dentition. Variations in dental development, both normal and abnormal, are discussed in great detail, but a minimum amount of information is presented on the treatment of potential problems.

The book is valuable as it enhances the reader's insight into the complex nature of the transition process from the primary to the permanent dentition. A thorough understanding of the end result of the many variations that can occur will leave the reader better equipped to decide when orthodontic intervention is necessary, and what effect that intervention may have on future development.

The book consists of 20 chapters, with the first seven chapters devoted to describing variations in the transition of primary to permanent teeth. This section is easy to understand and utilizes a combination of photographs and schematic diagrams to effectively illustrate the transition process. Chapters 8 through 18 deal with specific problems associated with this transition from primary to permanent dentition, with some general information on treatment options. Of particular interest is Chapter 12, which discusses abnormal lip positions during and after the transition of the incisors. It would have been of interest to have similar information presented on the interaction between tongue function and the transition process.

In fact, there is very little information offered on mechanical procedures. Chapters 19 and 20 deal with orthodontic treatment of the adult patient in very general terms. These two chapters do not integrate well with the overall thrust of the book, and do very little to enhance the reader's knowledge. The book's title is perhaps misleading, since this book does not deal with correction of facial skeletal problems.

In conclusion, the book is an excellent source of detailed information on the transition process from the primary to the permanent dentition. It would be a very use-

ful reference source for undergraduate students, and could assist practising dentists in refreshing their understanding of this process.

Reviewed by:
Dr. Paul Major, Associate Professor
Division of Orthodontics
University of Alberta

ESSENTIALS OF TRAUMATIC INJURIES TO TEETH

by J.O. Andreasen and
F.M. Andreasen

1990, Munksgaard
Copenhagen, Denmark
168 pages (with numerous illustrations)

This well-written book on dento-alveolar trauma is useful for both the general dental practitioner and the oral and maxillofacial surgeon. It may also be useful as a ready reference source in an hospital emergency room.

The presentation of the material is clear, concise, and attends to detail when needed. The exception is the first chapter, which involves the examination of the patient. This chapter is very simplistic and does not effectively deal with the evaluation of closed head and spinal injuries. However, the information contained in every other chapter is well presented, illustrated and supported by the authors' personal research as well as an extensive bibliography. The illustrations provide the practitioner with an excellent overview of the probability of successful treatment. There is good photography throughout the text.

In summary, this text is an excellent reference book, especially for a dentist in a rural dental practice who may not have access to an oral and maxillofacial surgeon. The authors should be congratulated for putting together a succinct reference for dento-alveolar trauma.

Reviewed by:
D.S. Precious, DDS, M.Sc., FRCD(C) and
Kevin E. Lung, DDS
Dalhousie University

DENTAL MAINTENANCE FOR PATIENTS WITH PERIODONTAL DISEASE 1ST EDITION

by: Thomas G. Wilson

1990, Quintessence Publishing Co. Inc.,
Chicago, 220 pages, B&W illustrations

Dental Maintenance for Patients With Periodontal Diseases is a special book, combining a detailed and comprehensive discussion of each of the topics explored with "at-a-glance" sections — found at the end of each chapter — for quick reference and summary purposes.

The book begins with an introductory page entitled "How to use this book," which sets the stage for the reader to derive full benefit from the text. Subject matter is presented in 14 chapters, with each chapter further divided into sections of related material. Each section commences with a bold heading and, of course, has its own "at-a-glance" summary. Within each section, the pertinent information is presented in a very logical pattern and every chapter has a comprehensive reference list.

Clinical pictures, radiographs, line drawings and flow charts are used to make the book both interesting to read and easy to understand. The "at-a-glance" sections integrate a wide variety of concepts related to many clinical problems and, in addition, solutions to the most common problems in the practise of periodontology are presented.

The author states that his intention was to combine his clinical biases with the scientific literature, and it appears that he was successful. It is our opinion that the author, with his vast clinical experience to draw on, has been able to address the problems in a valid, practical way, and he has the credibility of the scientific literature to support his position.

In Chapter 1, the author provides a philosophical overview of new developments in dentistry and stresses the importance of maintenance therapy. Chapter 2 contains an impressive, detailed description of medical history taking, examination, charting and the classification of periodontal diseases, and includes an extremely well-done section on disease activity.

Through this section, the author provides an excellent account of the investigations that are available for detecting active periodontal disease sites, outlining what parameters could be used and what the results may mean. The description is clearly supported by current references and the text is very straightforward and readable. Unfortunately, this chapter is marred somewhat by the exclusion of the concept of prescription radiography in periodontics, although the author has partially compensated for this by referring to radiographs strictly as adjuncts for assessing the disease activity.

Chapter 3 covers the sequencing of treatment. The initial description follows well-accepted concepts in treatment planning, but stresses that the sequence of treatment may have to be altered depending on specific factors relating to an individual patient. Chapter 4, entitled "*Reduction of bacterial population in the oral cavity*," has been divided into three sections. The author discusses the pros and cons of the mechanical devices used to disrupt plaque, and most of the currently available chemotherapeutic plaque control agents are also mentioned, with appropriate references. Other topics explored in this chapter include the efficacies of various delivery systems, subgingival irrigation by the professionals, and the personal approach of five clinicians to oral hygiene.

In Chapter 5, "*Removing Tooth Borne Dental Deposits: Mechanical Means by the Professional*," the author describes the rationale for mechanical debridement and points out the discrepancy between this procedure and the goals of periodontal therapy. The description of periodontal hand instruments is adequate, as is the discussion on the procedures of scaling and root planing.

The chapter on restorative dentistry and its effects on the periodontium includes a discussion on patient home care following restorative dentistry, the design of restorations, and biological concerns. The role of occlusal trauma as an etiological factor in periodontal disease is thoroughly covered as well. Overall, this is probably the most essential and helpful chapter of the book for a general dental practitioner.

Selected topics, such as the diagnosis and treatment of dental hypersensitivity, special considerations for the dental maintenance of diabetic patients and the prophylactic coverage with antibiotics for heart prosthesis cases are excellent additions to the book. The recommendations of the American Heart Association are included, although we believe that these recommendations should be updated frequently.

Last, but not the least, the final chapter of the book deals with improving patient compliance. No other area in health care is more dependent on patient compliance than periodontics, and the strategies suggested by the author to increase patient compliance are most welcome.

This book provides concise but comprehensive information on the maintenance of patients. It covers not only periodontal disease, but a wide range of other dental conditions as well. We have no hesitation in recommending this book for undergraduate dental students, general practitioners, graduate students and dental specialists.

If the issues discussed in this book were incorporated into the undergraduate curriculum and dental practices, then the practice of dentistry would certainly become more ideal.

Reviewed by:
H.S. Sandhu, DDS, PhD, Dip. Perio.

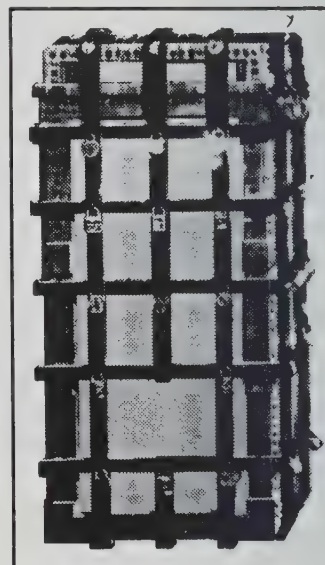
Associate professor, division of periodontics, faculty of dentistry,
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Sports Dentistry

La dentisterie sportive

1. Bakland, L.K. and Boyne, P.J. "Trauma to the oral cavity." *Clinics in Sports Medicine*. Jan. 1989; v. 8(1), pp. 25-41.
2. Blignaut, J.B. and others. "Injuries sustained in rugby by wearers and non-wearers of mouthguards." *British Journal of Sports Medicine*. Jun. 1987; v. 21(2), pp. 5-7.
3. Bolhuis, J.H. and others. "Dental and facial injuries in international field hockey." *British Journal of Sports Medicine*. Dec. 1987; v. 21(4), pp. 174-7.
4. Castaldi, C.R. "Sports-related oral and facial injuries in the young athlete: a new challenge for the pediatric dentist." *Pediatric Dentistry*. Dec. 1986; v. 8(4), pp. 311-6.
5. Chandler, N.P. and others. "A modified maxillary mouthguard." *British Journal of Sports Medicine*. Jun. 1987; v. 21(2), pp. 27-8.
6. Chapman, P.J. "Mouthguards and the role of sporting team dentists." *Australian Dental Journal*. Feb. 1989; v. 34(1), pp. 36-43.
7. Dreyer, R. "On guard." *RDH*. Jan. 1989; v. 9(1), pp. 20, 22.
8. Garon, M.W. and others. "Mouth protectors and oral trauma: a study of adolescent football players." *Journal of the American Dental Association*. May 1986; v. 112(5), pp. 663-5.
9. Kerr, I.L. "Mouth guards for the prevention of injuries in contact sports." *Sports Medicine*. Nov.-Dec. 1986; v. 3(6), pp. 415-27.
10. Kumamoto, D.P. and Di'Orio, L.P. "An interprofessional learning experience in sports dentistry." *Journal of Dental Education*. Aug. 1989; v. 53(8), pp. 491-4.
11. Linn, E.W. and others. "Facial injuries sustained during sports and games." *Journal of Oral and Maxillofacial Surgery*. Apr. 1986; v. 14(2), pp. 83-8.
12. Polese, R.P. "Sports dentistry." *University of Toronto Dental Journal*. Fall 1988; v. 2(1), pp. 7-9.
13. Sane, J. and others. "Maxillofacial and dental ice hockey injuries." *Medicine and Science in Sports and Exercise*. Apr. 1988; v. 20(2), pp. 202-7.
14. Sawa, D.L. "Sports dentistry. The needs of the competitive athlete." *Oral Health*. May 1987; v. 77(5), pp. 35-6.
15. Stenger, J.M. and others. "Mouthguards: protection against shock to head, neck and teeth." *Basal Facts*. 1987; v. 9(4), pp. 133-9.

16. Verban, E.M. Jr. "The MORA. Its application in the field of athletics." *Basal Facts*. 1987; v. 9(2), pp. 63-8.
17. Welbury, R.R. and Murray, J.J. "Prevention of trauma to teeth." *Dental Update*. Apr. 1990; v. 17(3), pp. 117-21.
18. Winters, J. "Promoting mouth protection in sports." *Dental Teamwork*. v. 4(3); May-Jun. 1991, pp. 20-22.

Library Acquisitions

Books

- Bellizzi, Ralph. *A clinical atlas of endodontic surgery*. Chicago: Quintessence, 1991.
- Grasso, Joseph E. *Removable partial prosthodontics*. — 3rd ed. — St. Louis: Mosby, 1991.
- Hamada, Shigeyaki. *Periodontal disease: pathogens & host immune responses*. Tokyo: Quintessence, 1991.
- Marcotte, R. Michael. *Biomechanics in orthodontics*. Toronto: B.C. Decker, 1990.
- Quarnstrom, Fred. *Electrical anesthesia in dentistry*. Seattle: Analgotronics, 1990.
- Scully, Crispian, Cawson, Roderick A., Griffiths, Mark. *Occupational hazards to dental staff*. London: British Dental Association, 1990.
- Seward, Margaret. *Into dental practice: a working guide*. London: British Dental Association, 1990.

Audio Cassettes

Mongini, Franco. *TMJ and the stomatognathic system: dysfunction and therapy*. [U.S.: Northeast Dental Seminars-Audio, 1986.]

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The DAP Advisor offers information, ideas and advice to improve dentist-patient communication, raise awareness about good dental health, and help your practice become busier.

A referral to a specialist can be a positive experience for the patient — provided you are involved in the process from beginning to end, and keep the lines of communication open between you and the specialist, and between you and the patient.

Honing Your Referral Skills

Every day, you and your dental team endeavor to meet the needs of your patients, and, in the process, foster loyalty to your practice. Occasionally, however, a patient requires treatment that only a specialist can provide. When this occurs, you have to hand off that patient to another dentist — and another dental team — for the duration of his (or her) treatment.

But even though you are, in effect, placing your patient in someone else's care, it doesn't mean that you should step aside. In fact, the patient's referral experience will undoubtedly be much more positive if you stay involved with his (or her) treatment from beginning to end, and do whatever you can to make the process as pleasant and uncomplicated as possible.

A positive referral experience will reflect well on you. It is an indication of the ongoing concern you have for your patients, and will make them feel good about having you as their dentist. These feelings can help build loyalty to your practice, and form the basis of a long-lasting and very successful relationship between you and your patients.

The key to ensuring that a patient has a positive referral experience is communication. It is essential that you keep the lines of communication open between you and the patient, and between you and the specialist. Here are a few suggestions that can help you to do this effectively — and thus help you to ease the patient through the referral process:

- **Discuss the referral with the patient**

From the patient's perspective, you are handing him (or her) off to someone else. If you explain why you are doing this — because you do not have the expertise necessary to perform a certain procedure, for example — the patient will be much less likely to feel that he (or she) is being "unloaded." You can also help to assuage the feelings of rejection a patient may experience by assuring the person that he (or she) is not being shunted aside, and that you intend to keep up with him (or her) until the required treatment has been completed. Such assurance will let the patient know that even though someone else is looking after him (or her) for the moment — someone in whom you have great confidence — you are still concerned about the patient and will continue to be involved in his (or her) care.

- **Match the patient to the specialist**

Patients have different personalities and temperaments; so do specialists. The referral experience is bound to be more positive if you try to match the patient with a specialist who, in your estimation, is most likely to meet the patient's needs. It comes down to knowing your patient and the specialists available, and then selecting a colleague that your patient is likely to "click" with. Don't feel too badly, though, if, despite your best efforts, the match doesn't work out. Sometimes it is impossible to foresee how individuals will respond to one another.

- **Make an appointment for the patient**

It is in the patient's best interests to see the specialist as soon as possible. One of the most vital services you can provide to the patient is to ensure that this happens. By making your patient's initial referral appointment, you can help to ease him (or her) into the referral process. You also demonstrate how much you care about the patient and the success of his (or her) treatment. Make sure, as well, that the patient knows the location of the specialist's office and how to get there.

- **Communicate with the specialist**

For your patient to receive the best possible care — and feel comfortable with the referral process — it is essential for the specialist to have the appropriate information on hand. It is up to you to ensure that the necessary records, X-rays, etc. are forwarded to the specialist promptly. First, you should complete a referral slip detailing the reason for the referral. The slip, which can be provided either by your office or the specialist's, can also include a request for an opinion on the patient's treatment. Next, it is crucial to get in touch with the specialist to discuss anything about the patient's personality or situation that you think might prove helpful.

Ideally, the communication between you and the specialist should be kept up until the patient's treatment is complete. That way, you will be aware of how the treatment is progressing and know what to expect when the patient returns to your care. You will also show the patient that you are concerned about the successful outcome of his (or her) treatment, and that you are making every effort to help the specialist bring this about.

- **Provide the pertinent records**

For the patient, nothing is more maddening — or more frustrating — than inefficiency. The patient sees it as a sign that the people who are supposed to be looking after him (or her) don't have the time or inclination to care about his (or her) well-being. It is therefore essential for you to ensure that the appropriate records and X-rays arrive at the specialist's office before the patient does.

Make sure, as well, that you keep copies of everything that you send to the specialist. And, unless it is an emergency, it is not a good idea to have the patient carry his (or her) X-rays to the specialist's office, as the prints might be damaged, mislaid or forgotten along the way. Instead, deliver or mail the X-rays directly to the specialist.

- **Call the patient after the first visit**

Patients tend to have short memories. Many of them will need to be reminded that, even though someone else is providing their treatment, you are still interested and involved in their care. Jog their memories by phoning them after their initial visit to a specialist and ask them if they feel comfortable with the specialist and if they are satisfied with the treatment they are receiving. In some rare instances, the fit between the patient and specialist may be so poor that a patient might insist on being referred to someone else. Should that occur, don't count it as a failure on anyone's part. Instead, consider it an opportunity to learn more about your patient and his (or her) needs.



The DAP Advisor is a service of CDA's Dental Awareness Program, an ongoing campaign dedicated to helping all Canadians keep their teeth Good For Life.

Successful investing and the CDA RSP

One of the hallmarks of the Canadian Dental Association's retirement savings plan (RSP) — administered for CDA by the Canadian Dental Service Plans Inc. (CDSPI) — is the personal service available to all participants. CDSPI's RSP staff are always on hand to provide dentists with sound information on programs that can result in their future financial independence.

Many dentists prefer to invest on their own and "self direct" their RSP contributions. However, this can sometimes have dire financial consequences, especially if their investment decisions are made without a clear understanding of the risks involved.

"We paid \$250 to lose \$5,000 in a few short weeks. . . ."

In our file of case histories, we have a recent report concerning a dentist who, after having decided to go it alone, deposited \$12,500 with a stockbroker at one of Canada's major financial institutions. The stockbroker then deposited the entire amount into what is commonly referred to as a volatile stock, buying the dentist 300 shares at \$25 each and an additional 200 shares for the dentist's spouse at the same price.

The dentist states that he "naively believed this person when he claimed that he could outperform the CDA RSP on any year to year basis. Within a few weeks the stock tumbled to \$14 a share. The broker did not keep me informed of the loss in value of the stock and to this day provides very evasive answers to my questions."

"To add insult to injury, I was billed \$128 and another \$128 was charged to my wife for management fees, which, if not paid, will be deducted from the RSP account. In other words, we paid \$256 to lose more than \$5,000 in a few short weeks."

This regrettable incident provides us with some things we can all learn — and profit — from.

When you attempt a self-directed RSP, the investment choice is left up to you. You must be knowledgeable about qualified investments and be able to spend a considerable amount of time monitoring such



a program. If you have the expertise to select proper investments, and the time to administer and monitor them, then go to it. But, normally your area of expertise is dentistry, and the expertise required for making sound RSP investments belongs to a professional fund manager. Therefore, unlike the dentist above, who gave carte blanche to the stockbroker, you must take time to learn about:

Commissions and management fees

Some plans charge up to nine-per-cent commission and two-per-cent management fees, plus various other fees for switches and redemptions.

The volatility of your investment

You should develop a track record on your investment choice, charting its rises and falls in value. Again, this is a time-consuming task.

Check these benefits available through the CDA RSP

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Managed by financial experts

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The CDA RSP has no front-end load fees, which means that the full amount of your

contribution is deposited (or invested) to your RSP. There are no commissions, no opening or closing fees, and no fees to switch from one fund to another. Low administration fees of less than one per cent per year puts more of your money to work for you.

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Should you require any additional information, please call, toll-free, to CDSPI's Retirement Services Department. Our CDA RSP staff are always on hand to assist you and offer personal service.

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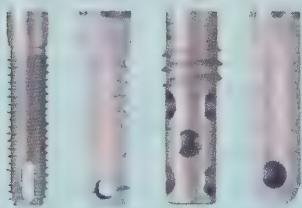
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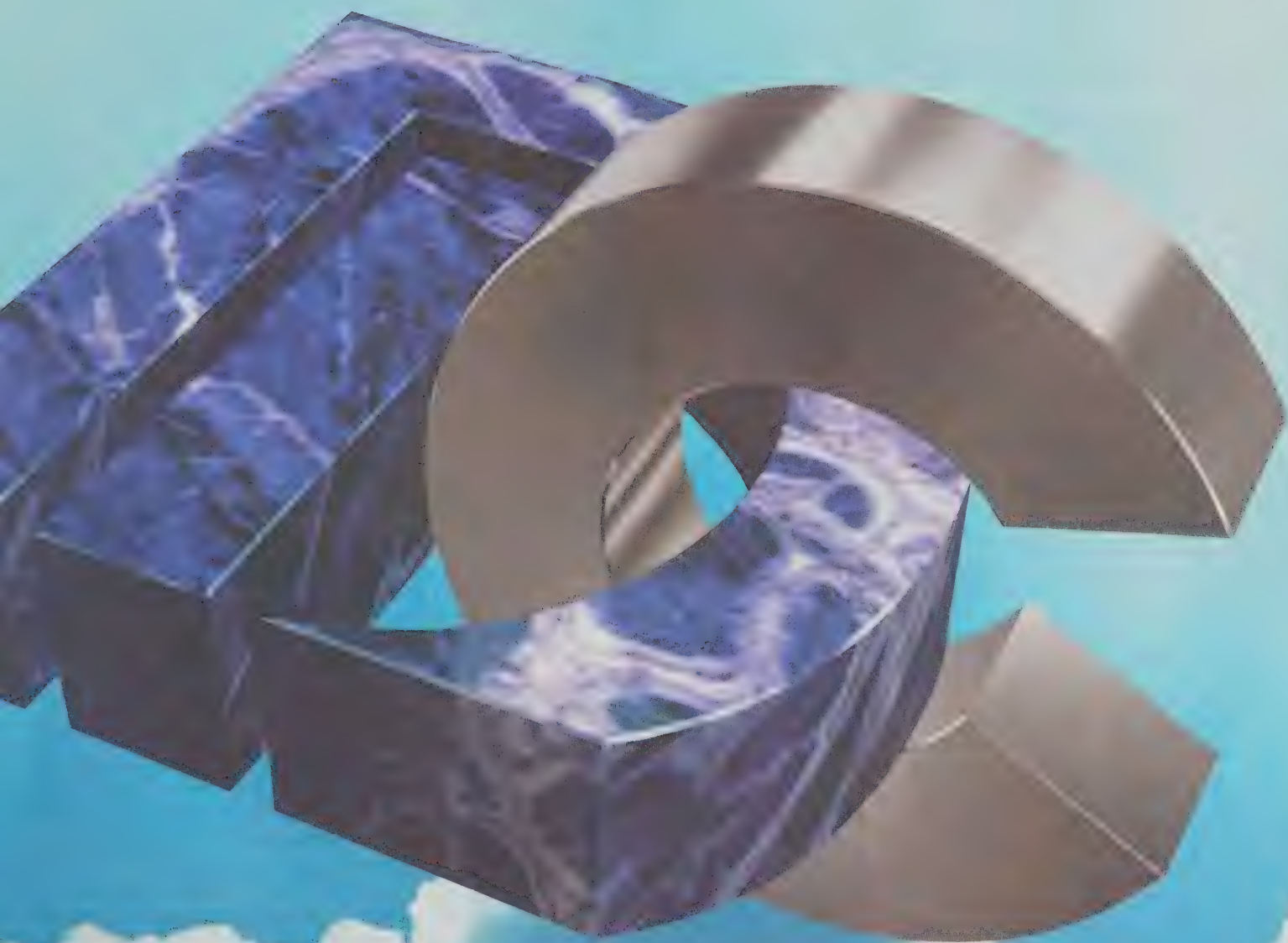
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The Dental Laboratory and You

The Self-Sanitizing Partial

Most of the attention, research and publicity related to the dental industry today has focused on two fields: cosmetic dentistry and osseointegrated implants. Both areas have witnessed exciting developments and will continue to evolve, offering more and better treatment options for dental professionals and patients alike. However, not every patient can afford these procedures and, more important, a particular clinical situation, or other factors, may contraindicate them. In many instances, a well-designed cast partial denture is still the best solution to the case situation.

Yet, even a tried and true treatment modality like the cast partial can be improved on. While literally millions of patients around the world wear cast partial dentures with little or no difficulty, comprehensive long-term clinical studies have confirmed that wearing partial prostheses often leads to progressive periodontal damage. This can include the loosening of abutment teeth, gingivitis and the exposure of the enamel-cement border. Even caries distribution has been shown to be aggravated.

These problems can affect the life of a prosthesis and the long-term value of the treatment considerably. Most damaging, in the long run, cast partial prostheses can effectively contribute to a comprehensive and often irreparable destruction of a patient's remaining teeth. Certainly, these types of problems can accompany any and all prosthetic work, but patients wearing partial prostheses are generally affected by them to a particularly high degree.

The Source of the Problems

The first and foremost cause of cast partial failures is plaque buildup, which results in a variety of related periodontal problems. In addition, even if the partial prosthesis is suspended on residual teeth, these teeth will sink or be displaced under load, particularly when free-end saddles are present. These saddles press against the periodontal membrane of the abutment tooth while the bar presses into the gingiva. The greatest damage occurs when the bar lies against or passes above the free gingival borders — damage that is often irreparable.



Mr. H.J. (Hyo) Maier

Excessively tight clasp retention also leads to problems with free-end prostheses. Tight clasps can increase the loosening of the abutment teeth, due to the difference in resilience between the periodontium and the crest. Finally, unintentional contacts between the prosthesis and the residual teeth can lead to attacks of caries.



Fig. 1. The self-sanitizing partial denture.

The Solution: The Self-Sanitizing Partial

Until now, many of these undesirable factors were accepted as part and parcel of cast-partial construction. With the self-sanitizing partial, available from your laboratory's Vitallium denture department, however, these problems need not occur.

Based on sanitary pontic designs involving the first missing tooth after an abutment tooth, the self-sanitizing partial is a

very modern approach to an old problem. Proven through long-term use in Scandinavia, the prosthesis was developed with plaque control, stress reduction on the abutment teeth, minimal tooth contact and optimal esthetics in mind. Plaque and food debris buildup are reduced by a hygienic clasp arm design that avoids any arm contact with the gingival border. Even if the prosthesis sinks slightly, it will not hit the periodontium of the residual teeth. As a result, the breakdown of the gingival attachment is prevented and gingival stress and trauma are avoided. Pocket development is also hindered, which, in turn, reduces the chance of periodontal disease and tooth loss.



Fig. 2. Better long-term dental health is truly achievable.

Today, many cast partial denture patients insist on having as little of the clasp showing as possible. While an invisible clasp has yet to be developed, the self-sanitizing partial addresses the demand for an esthetically-pleasing prosthesis by incorporating Finish Line retainer clasps. A short, wrought-wire arm ensures maximum retention and flexibility while requiring minimal crown modifications. Only two or three abutment teeth are necessary for retention — with minimized stress. The Finish Line retainer clasp works extremely well when clasp anterior teeth and can be used in conjunction with conventional clasp on posterior teeth.

With the self-sanitizing partial denture, better long-term dental health is truly achievable. Ask your laboratory about this exciting new treatment option today.

Mr. H.J. (Hyo) Maier, RDT is president of Aurum Ceramic/Classic Dental Laboratories Ltd.

Practice Management & Success

Ready • Aim • Fire

Target Marketing in the Dental Practice

Like it or not, consumerism is becoming a reality in the health-care field. Today's patients are starting to view dentistry as a profession that provides goods and services just as any other profession, business or industry does. Thus, while it is probably unfair to say that patients no longer recognize the importance of visiting their dental offices on a regular basis, dentists must now compete in the marketplace for the patients' discretionary income.

There are a number of basic marketing techniques that a dentist can use to sell his practice to the public. These include promoting good telephone skills among his or her office staff, developing sound communications strategies and follow-up techniques, referral management, and so on. The other key area the dentist should focus on is market position.

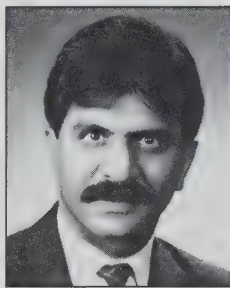
Adding Value to Dentistry

Developing a market position involves creating a culture around a product or service that attracts certain people to it. For example, Hyundai and BMW are both in the car industry, and the average consumer's transportation needs can be met by either company's products. But, there is a great difference between the typical purchaser of a Hyundai and the purchaser of a BMW. The difference is in the customer's perception of value.

To Hyundai purchasers, price is a considerable influence. They value Hyundai cars because these products allow them to meet their transportation needs cost-effectively. But to BMW purchasers, prestige is much more important. They value BMW products because these cars have a high reputation for design and performance. In other respects, the purchasers of BMW and Hyundai products are identical. They both value quality, good options, fit and finish, comfort and handling.

Both BMW and Hyundai have tailored their marketing strategies to the *typical* customer they want to attract to their products. And each company has enjoyed considerable success as a result of effective target marketing.

Target marketing (also called strategic or niche marketing) can be a useful technique in dentistry as well. An otherwise nondescript dental practice can give its patient flow a boost by simply identifying and



Imtiaz Manji, B.Sc.
President of
ExperDent
Consultants, Inc.

focusing on particular types of patients.

The dentist must recognize that patients have wants and needs that go beyond good dentistry. Patient attitudes are affected by their age, income level, marital status, life style and other factors. A practice that reflects and addresses the factors that are important to a patient is more likely to retain that patient. Furthermore, the patient will attach more value to his or her dental visits, and will be more likely to make referrals. As new patients come on stream, the practice can build an atmosphere that caters specifically to the particular needs of certain types of patients.

Step 1: Identify Niches

To properly create a target market, you need to understand your patient base. You can't be all things to all people, obviously. You can provide good dentistry to any patient, but effective target marketing means that your practice gives something extra to certain patients — an environment tailored toward their convenience and comfort.

Start by asking questions about your patient base.

- What are the different types of patients I see in my practice?
- What are the income levels of my patients?
- What kinds of patients are easiest to retain?
- How does age, gender, marital status and type of employment determine my patient base?
- Does my location naturally attract certain kinds of patients?
- What kind of patient tends to make more referrals to my practice?
- What kinds of patients do I enjoy treating?

By analyzing your answers to these questions, you should be able to identify several niches in your patient base. Be sure to evaluate what percentage of your

patients fit into each niche. Some of the most common niches are: children and families; business and professional; fearful; elderly; young adults; and minorities.

Step 2: Understand Patient Needs

The second step to target marketing is determining the special concerns of each group of patients that fall into the niches you have identified in your practice. You need to understand what their particular wants and needs are. Why have these patients come to your practice and why do they stay?

A good way to find out more about the patients in a particular niche is to send out a patient survey. The survey canvases your patients for their opinions about your practice, and provides you with a framework to determine their unique values and preferences. A good survey asks specific questions about areas you think are of importance to these people. And, it will also ask open-ended questions to determine areas of value or interest that you have not realized.

Take the time to carefully analyse the results of a patient survey. It makes no difference how good your questions are if you don't take full advantage of the answers they generate.

Develop an accurate profile of the typical patient in the niche. Include such factors as income level, marital status, health awareness, political and social values, image, and so on. These factors shape your marketing strategy in much the same way that BMW and Hyundai's marketing strategies are based on the wants and needs of their target audiences.

Step 3: Rise to the Challenge

For marketing to be effective in the dental practice, it must be patient-centred. Once you have identified the niches in your practice, choose one as a target market. It is possible to choose more than one, but only when the selected niches overlap a great deal or your practice has the resources to independently meet the needs of both patient groups.

Select a niche that will increase the success of your practice. To target market effectively, you must send a strong message to your patients about the philosophy of the practice. It is important, however, that the niche you select accommodates many of your existing patients. For example, you do not want to target the practice

toward professionals if the lion's share of your patients come from blue-collar families. The inconsistency between the two value systems — that of the professionals you wish to attract and the blue-collar families you already have — could throw your practice into turmoil.

Once you have selected your target market, go back to the profile you developed about that niche. You need to orient the practice's philosophy, style, activities and materials to identify with the niche profile. Your current marketing strategies need to be adjusted to allow the niche's profile to *flavor* your approach, so that your practice reaches peak effectiveness when dealing with the target market.

Selecting a target market often reveals areas of the practice that need immediate change to create the desired atmosphere. This can be as simple as stocking different magazines in the reception area or as far-reaching as renovating the entire office to provide an atmosphere as close to home as possible.

Don't forget about your staff! They play an important role in developing the image of your practice. Give your staff the information they need to understand the marketing program. Help them to recognize the target market and educate them on the niche profile. They need to understand the needs of the patient being targeted to reinforce the environment you are creating.

Step 4: Spread the Word

Once you have readied your practice and aimed it at the target market, get the message out. Let your patients know about the practice's expanded mission.

"An otherwise nondescript dental practice can give patient flow a boost by identifying and focusing on particular types of patients."

It is critical that practice materials are developed in a manner that is consistent with the new marketing direction. Your logo and letterhead must "feel" right. A brochure should be developed that reflects the image and specific concerns of the niche market. Newsletters should reinforce the message, and topics of interest to the niche should be given priority. For example, elderly patients are more concerned about the effects of aging on teeth than a young adult is. Children are more likely to enjoy a "fun" approach while business people prefer an efficient, no-nonsense style.

Target marketing is a gold mine for referrals. Creating an environment tailored to the patient's needs results in a patient that understands, values and appreciates your

practice more. If you have marketed well and introduced real, patient-centred marketing strategies, your patients will be more comfortable making referrals — they recognize easily that you understand them personally.

Four Target Markets

Four of the most commonly identified target markets are children and families, business people and professionals, fearful patients and the elderly. Here are some suggestions and observations about each of these groups that could be helpful in developing a target-marketing plan.

Children and Families

Children can be difficult to reach because they do not understand what happens in a dental office. They may arrive at your office with negative attitudes that reflect their parents' opinions of dentistry. Gaining their trust is an important step to developing a good relationship with them.

The best strategy for dealing with children is to make the dental visit fun. Stock your reception area with a variety of activities and games that appeal to children of various ages. Nintendo machines, puzzles, stories, and coloring books are all good activities. Keep the decor bright and cheerful, and decorate some operatories specifically for children. Cartoon characters and images like the Teenage Mutant Ninja Turtles, teddy bears and the like are usually popular. Cavity-Free clubs, contests and take-home kits extend the practice's positive, upbeat approach.

Parents needing dentistry will often send a child in first and then make an appointment if the child's visit went well. Plan visits so that the whole family can be treated in a minimum number of appointments. Since parents have the interests of their children at heart, impress upon them the importance of each child's dental health. Economic pressures will play a smaller role if dental care is perceived to further a child's well-being.

Community service, such as giving after school education sessions on brushing — provided at no charge for children — can be effective for bringing new families to the practice as well. Remember that today's child patient is tomorrow's adult patient.

Business and Professional

Learn to recognize patients who are supervisors, personnel officers, managers and directors. These people can influence many others in their organizations and can thus be valuable referral sources. Work especially hard to make these people comfortable in your practice.

Equip your reception area with amenities

that appeal to busy people. Provide a telephone so that business and personal calls can be made if the patient arrives early for his or her appointment. If you have enough room, provide some table space where a patient can write a letter, memo or make notes. Ensuring that patients have access to a fax machine or message service, and even answering portable phones during appointments, are good techniques to let business people know that you understand they are busy. In addition, the reception area should be stocked with a range of relevant business, computer and professional magazines.

Always be on time for appointments, since professionals equate waiting time with wasted time. A direct, professional approach by all team members is critical. These are characteristics the patient values in their own organization. The decor of the office must be efficient and scrupulously organized. A reception desk (as opposed to a counter) is a nice touch.

Fearful

There are many patients in every dental practice that require treatment (and know it) but do not make an appointment because of fear — even if they are in pain. The fearful patient is difficult to identify. Very often, however, these are patients who chronically cancel appointments, or don't show up for them.

The new patient experience is especially important for fearful patients. You must emphasize the concern you have for these people and let them know you will take care to minimize their discomfort. Listen carefully to their concerns and take the time to explain exactly what will happen during the visit. When the patient is in the chair, make sure they are relaxed and ready before beginning treatment. Develop a gentle touch and soothing style of conversation. It is especially important to meet one-on-one with the fearful patient after their first hygiene visit. If the patient has not had continuing care treatment in some time, the hygiene therapy may have been rough. Emphasize that the treatment is the most uncomfortable on the first visit, and that it will be less so on subsequent visits.

Your team must excel at stress management, and the atmosphere of your office must be calm, relaxed and uncluttered. A fearful patient will pick up on any stress in the dental team and it will increase his or her anxiety. A busy, loud, jostling environment will make them tense. Never leave the fearful patient waiting in the reception area. You must treat them promptly, because every minute they wait can double their anxiety.

Disguise some of the smells and sounds

WE KNOW HOW DIFFICULT IT IS TO GET YOUR PATIENTS TO FIGHT PLAQUE.



It's a message that you've been trying to drum into your patients' heads for years: to prevent gum disease it's imperative to brush and floss. ■ A basic tenet of oral hygiene, right? Logical. Irrefutable. ■ Yet some people still don't take a blind bit of notice. You see the signs of their neglect every day. ■ So what are you to do? ■ Continue to hammer away at them every six months. ■ And at the very least, encourage them to use Listerine Antiseptic. ■ By rinsing with Listerine for 30 seconds, twice a day, (that's

in addition to their usual oral hygiene), your patients can reduce plaque and gingivitis by as much as 34%^{1,2,3,4} over brushing alone. ■ Do you still need more proof? Listerine is the leading over-the-counter rinse to have earned the American Dental Association Council on Dental Therapeutics' Seal of Acceptance for proven antiplaque/antigingivitis efficacy.⁵ ■ We're not kidding ourselves. Convincing your patients to fight plaque and gingivitis is clearly an uphill battle. But Listerine may just give them the push they need.

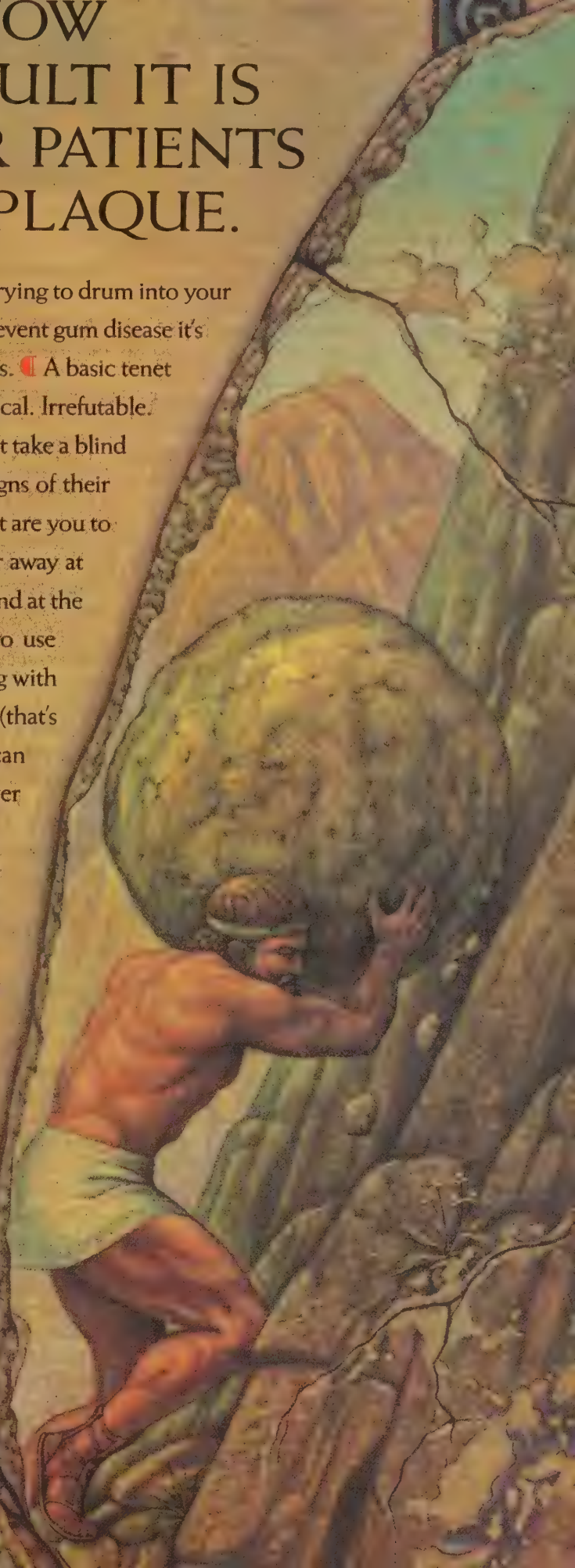
**ACCEPTED BY THE ADA TO HELP
PREVENT AND REDUCE SUPRAGINGIVAL
PLAQUE AND GINGIVITIS.**



Listerine has been shown to help prevent and reduce supragingival plaque accumulation and gingivitis when used in a conscientiously applied program of oral hygiene and regular professional care. Its effect on periodontitis has not been determined.

**COUNCIL ON DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION.**

REFERENCES: 1. Lamster J.B. et al. CLIN. PREV. DENT. 3:12-16, 1983. 2. Gordon J.M. et al. J. CLIN. PERIODONTOL. 12:697-704, 1985. 3. DePaola L.G. et al. J. DENT. RES. 46:311-315, 1989. 4. Overholser D. et al. J. CLIN. PERIODONTOL. 17:575-579, 1990. 5. Council on Dental Therapeutics Accepts Listerine. J. AMER. DENT. ASSOC. 117:515-516, 1988



of the office. Music is good. A water fountain in the reception area (if you have room) can mask the sound of a drill. Popcorn machines can hide odors.

When fearful patients are "won over" and overcome their fear under your care, they become fiercely committed to the practice. They will refer patients to you with vigor, believing that you must be a great dentist if you can treat them so well and with such little discomfort.

Elderly

Currently, one third of the Canadian population is between the ages of 25 and 45 (the baby boomers). As these people age, the focus in dentistry will shift to the older patient. Statistics from the United States already show some startling figures: people between the ages of 65 and 75 have the highest discretionary incomes, and 70 per cent of the country's wealth is held by people over 50. Clearly, the elderly patient is a growing market for dentistry.

Communication is a critical concern when dealing with the elderly patient. Newsletters are very important and educational materials should focus on the effects of aging on dental health. Remember to use a large, easy-to-read typeface when printing office forms, newsletters and correspondence. Verbal communication with the patient is vital as well. Telephone skills must be polite and polished. During the patient's visit, allow extra time for discussion about the treatment.

Recognize that many patients develop physical problems as they age. They have trouble negotiating stairs or finding transportation. Hearing problems can make communication difficult. Your staff must understand these special needs and have strategies ready to circumvent them.

Most importantly, the environment in the office must be warm and friendly. The patient must be welcomed into the practice on each visit. A sense of family is important — your office will be successful with elderly patients by genuinely expressing how important they are to you.

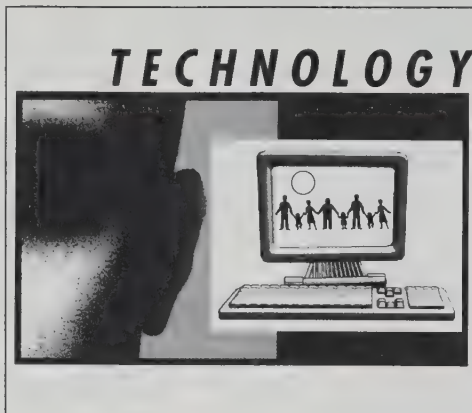
Strategic Approach

Developing a target marketing strategy takes time. Results are never immediate, and it may take years to fully realize your goals. Build on your strengths and keep focused. Over time, your practice will respond to your marketing strategies. Studies show that it takes nine exposures to a marketing concept before target people develop awareness. So marketing is an exercise in both consistency and endurance. Δ

The best time to plant a tree is 20 years ago.

The second best time to plant a tree is today.

• Ancient Chinese Proverb



Image'ine That

By now, I think everyone has read at least one article on video imaging or has had a chance to see a system at a convention or meeting. Video imaging is a remarkable technology that is especially beneficial to dentistry.

One of the problems you face on a day-to-day basis is explaining to patients how a procedure will affect their smile. This is not limited to cosmetic treatments, either. Emergencies, crown and bridge work, surgical procedures, TMJ treatments and even routine hygiene therapy can affect appearance. Patients are nervous about any procedure that results in oral changes, since a smile is an important part of relating to other people.

As a dentist, you have an unfair advantage. Your schooling and experience have given you an innate perception of how a smile will change as a result of treatment. But how do you explain that to a patient? Video imaging is the answer. Rather than describing the change in words, which the patient has to mentally visualize, you can translate your experience into a picture that the patient can actually see, getting your point across without ambiguity.

The Heart of the System

Using a video-imaging system is as easy as 1-2-3. Sit the patient down and have them smile. Instruct the computer to take a picture of the patient's mouth and display it on the screen. Then use the computer to edit (draw on) the picture to reflect how the patient's smile will appear after treatment.

The computer controls the entire process. It displays the image of the patient's mouth on the screen and accepts commands from you to make changes. When you are done, you can save or print the resulting picture for future reference.

The computers used for video imaging are the same personal computers that are used in most offices for word processing or dental software packages. The popularity of these computers stems from their low

cost and generality — they can be customized to do almost any task.

Customizing a basic computer system to do video imaging requires you to add on three special pieces of equipment:

- a camera and interface card;
- a high-resolution monitor and interface card;
- a drawing tablet.

The camera is connected to the computer via a special interface card that is installed in the main computer unit. Once the card is installed, the computer will know how to receive information (i.e. the picture of the patient) from the camera.

Video imaging only makes sense if the picture displayed on the screen is a high-resolution photo of the patient. That is why a high resolution monitor is required. Once the computer has received the picture from the camera, it sends it to the screen to be displayed. An interface card for the monitor tells the monitor how to display the picture being sent to it by the computer's memory.

The drawing tablet connects directly to the computer without needing an interface card. Everything else in the video imaging process is controlled by the software. When you issue a software command to the computer to make a change to the picture, the software updates the picture in the computer's memory and then tells the monitor to display the new image.



Expandability = Cost-Effective

The beauty of video imaging and desktop computers is expandability. Because the computer is a general tool, it can be customized for many tasks. The same computer you use for video imaging can also be used with an intra-oral camera. All you need to add is the intra-oral camera stylus and software. The same process holds true for other technologies like Tek-Scan or voice charting. Simply add the pieces you need.

There is a limit, though, and only so much equipment can be connected to one computer. But the important point to remember is that a smart investment now can be expanded in coming years to handle new technologies. Δ

Continuing Education

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DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
Le 29 août Le 30 août Le 31 août	La parodontie douce	Parodontie	D ^r R.-G. Landry D ^r J.-F. Tessier			Dentistes
Les 11 et 12 octobre Les 8 et 9 novembre	L'homéopathie et la médecine dentaire	Dentisterie générale	D ^r P. Picard D ^r G. Vézina D ^r H. Cocaud M. Y. Bourgault	4 jours		Dentistes
Le 26 octobre	Examen et diagnostic de l'état fonctionnel de traitement	Dentisterie générale	D ^r P. Jean	1 jour		Dentistes
Le 9 novembre	Révision des notions de détartrage-surfaçage curetage	Dentisterie générale	M ^{me} D. Lachapelle D ^r R.-G. Landry			Dentistes Auxiliaires
Les 7, 14, 21 et 28 février Les 6 et 29 mars	Prothèse complète amovible Avancée I	Prothèse dentaire	D ^r N. Tardif	6 jours		Dentistes

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CONTACT: Dr. Steve Patterson
Ms. Debbie Grant
(403) 492-5023 or 492-8240

DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
October 26 Edmonton	Computers in dentistry	Computers	Dr. Stringham Dr. Holland	Full-day lecture Demonstration	TBA	Dentists Auxiliaries Technicians
November 23 Edmonton	Dental hygiene update	Dental hygiene	Trish O'Heir	Full-day lecture	TBA	Dentists Auxiliaries
November 30 Calgary	Current pedodontics	Pedodontics	Dr. Elbadrawy	Full-day lecture	TBA	Dentists Auxiliaries
February 22-29 Caribbean cruise	High-tech dentistry	Lasers, materials CAD/CAM	Dr. Leinfelder Dr. Major Dr. Dederich	Full-day lecture	TBA	Dentists Auxiliaries Technicians

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Winnipeg, Manitoba R3E 0W2

CONTACT: Darcy Duggan
(204) 788-6631

DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
September 14	CPR for the dental team	Emergency training	Dr. R. Boyar Mrs. J. Wood			Dentists Auxiliaries
October 2	Dental hypersensitivity		Dr. D. Pashley			Dentists
October 2	Trott memorial lecture		Dr. D. Pashley			Dentists
October 17, 18, 19	Abfractions		Dr. J. Grippo Dr. R. Jordan Dr. M. Suzuki	3 day lecture participation program		Dentists
November 15	Cosmetic dental materials and techniques	Esthetics	Dr. J. Kanca III			Dentists

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DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
November 15	Adhesion in restorative dentistry		Dr. R.L. Bertolotti			Dentists
November 23	Alpha Omega Memorial Lecture Nutrition, Fitness and Body Fat	Nutrition	Mr. C. Bailey	Lecture		Dentists Auxiliaries
January 18	CPR for the dental team	Emergency training	Dr. R. Boyar Mrs. J. Wood			Dentists Auxiliaries
February	Single root endodontics for the general practitioner	Endodontics	Dr. M. Peikoff	3 Saturdays		General Practitioners
February 8	RRSPs for dentists	Financial planning	Dr. J. Stockton			Dentists
March 5, 6, 7	Mini oral surgery residency for general practitioners	Oral surgery	Dr. A. Stoykewych Dr. J. Curran	1 full day 2 half days		General Practitioners

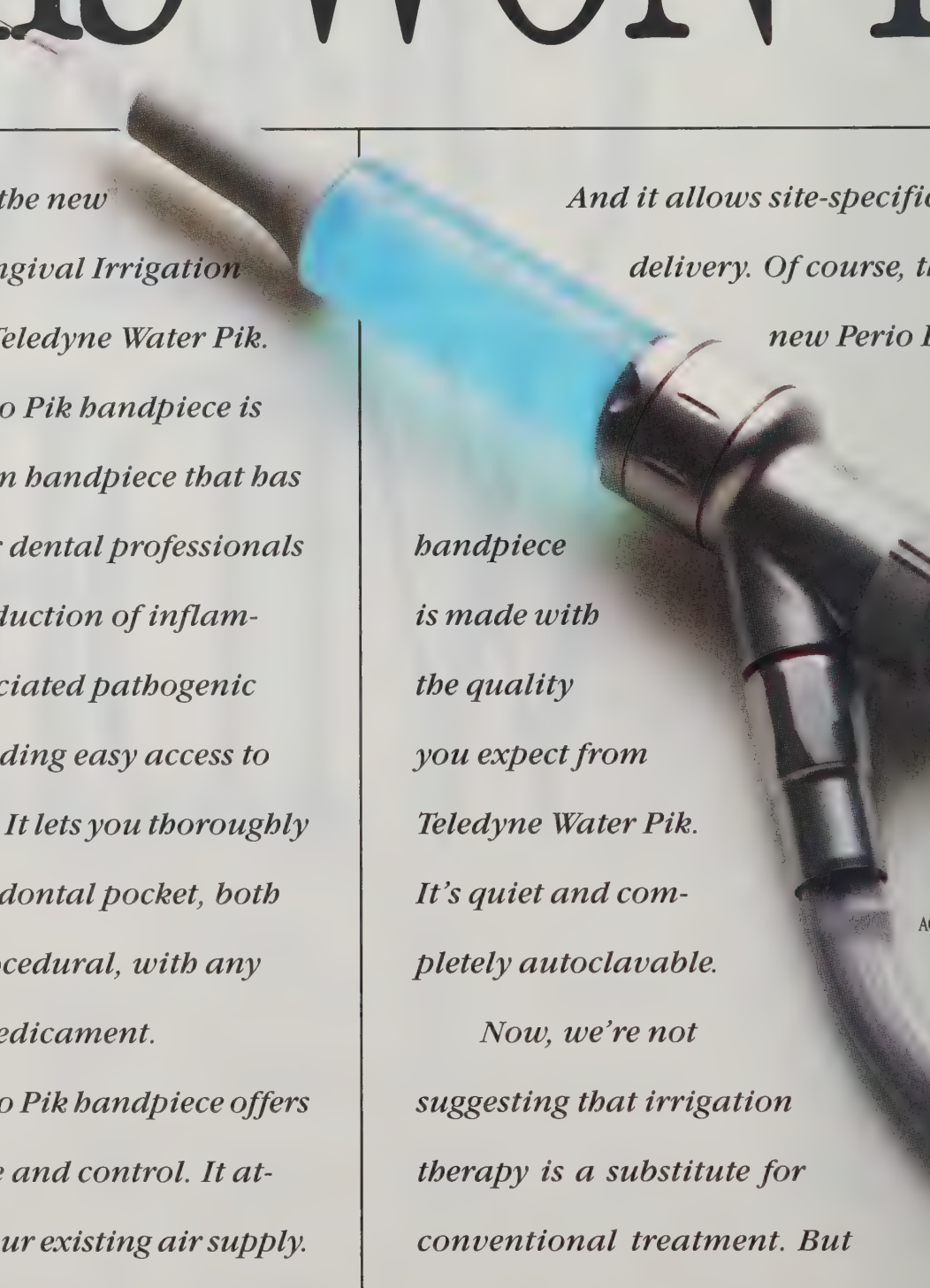
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Halifax, Nova Scotia B3H 3J5

CONTACT: Kate MacDonald
(902) 494-1674

DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
September 9-15 Banff, Alberta	Photo/hiking seminar	Photography	Dr. K. Zakariasen Marilyn Kline Bruce Moxley	Open	\$375	Dentists Auxiliaries Technicians
September 20 Halifax	Techniques for successful crown and bridge	Prosthodontics	Dr. J. Gerrow Dr. D. MacIntosh	Participation	\$310	General Practitioners Technicians
September 20 Halifax	Provisionals your assistant can do for you	Prosthodontics	Ms. J. Boutilier Ms. N. Sheppard	Participation limited (16)	\$ 95	Assistants
September 20 Halifax	Heart saver plus	Emergency training		Participation limited (16)	TBA	Dentists Auxiliaries
September 28 Halifax	Is the recession over?	Periodontics	Dr. E.J. Hannigan Ms. T. Harris	Lecture Open	TBA	General Practitioners Hygienists
October 19 Wolfville, NS	Ultra quality, ultra service, ultra caring	Practice management	Dr. T. McDougal	Lecture Open	\$195 \$ 75	Dentists Auxiliaries
November 1 Halifax	Demystifying articulators	Prosthodontics	Dr. R. Brygider Dr. D. MacIntosh	Lecture Open	TBA	General Practitioners
November 1 Halifax	Lab procedures for dental assistants		Ms. H. Greenwood	Lecture participation	\$ 95	Assistants
November 16 Halifax	Hourigan simplifies exodontia	Oral and maxillofacial surgery	Dr. M. Hourigan	Lecture Open	\$195	General Practitioners
November 23 Halifax	Career enhancement for hygienists		Prof. J. Clovis	Lecture Open	\$ 95	Hygienists
December 7 Halifax	Periodontal instrumentation	Periodontics	M. Kinnear D.H. Faculty	Participation Limited (18 Afternoon)	\$ 50 \$175 all day	General Practitioners

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DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
September 21 Vancouver	Current concepts in fixed prosthodontics	Fixed prosthodontics	Dr. U.C. Belser	Lecture	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
October 5 Vancouver	Incorporating periodontics into general practice	Periodontics	Dr. W.J. Killo	Lecture	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
October 19 Vancouver	The restorative potential of implant dentistry	Implantology	Dr. C.E. Jansen	Lecture	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
October 26 Vancouver	Oral care for patients with HIV disease. What's new?	Community dentistry	Dr. J.B. Epstein	Lecture Open	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
November 2 Vancouver	Business and clinical management strategies	Practice management	Sally A. Mackenzie	Lecture Limited	TBA	Dentists Auxiliaries Technicians
November 23 Vancouver	Optimum esthetics in maxillary anterior crowns	Operative dentistry	Dr. R.D.K. Wilson	Lecture Open	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
December 7 Vancouver	Treatment planning for complex cases — multidisciplinary coordination		Dental Specialists Society of B.C.	Lecture Open	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
March 7, 8, 9 Vernon, BC Ski seminar	New techniques in cosmetic dentistry	Esthetics	Dr. J. Kanca III	Lecture Limited	TBA	Dentists Auxiliaries Technicians
April 11 Vancouver	Update in conservative esthetic dentistry: 1992 and beyond	Esthetics	Dr. H. Heymann	Lecture Open	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians
May 9 Vancouver	Guided tissue regeneration for periodontal defects and dental implants	Periodontics	Dr. W. Becker	Lecture Open	\$125 \$ 75 \$ 95	Dentists Auxiliaries Technicians

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CONTACT: Jennifer White
(416) 979-4503

DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
September 4-6	Surgical and prosthodontic aspects of osseointegration — I: Treatment of the edentulous patient	Implantology	Dr. G. Zarb			Dentists
September 20 October 18 November 15	CPR — Basic rescue and recertification	Emergency training	Emergency service training programs			Dentists Auxiliaries
September 30	Surgical aspects of osseointegration	Implantology	U.L.F. Lekholm			General Practitioners
September 21	High-tech root canal preparation and obturation	Endodontics	Dr. H. Martin	Hands on		General Practitioners

November 8, 9	Endodontic participation course in the treatment of the curved canal	Endodontics	Dr. F. Weine	Participation	General Practitioners
November 16	General Practice Day	General dentistry	Dr. D. Smith		General Practitioners
November 28, 29, 30	Nitrous oxide in dental practice	Anesthesia	Dr. E. Young		General Practitioners
November 30	Photography in dentistry	Photography	Rita Bauer		General Practitioners Auxiliaries
April 23	Emergency procedures in the dental practice	Emergency training	Dr. E. Young		General Practitioners
April 30 May 1, 2	Orthodontics for the general practitioner	Orthodontics	Dr. G. Altuna		General Practitioners

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CONTACT: Ms. Najet A. Hassan
(519) 661-3902

DATE/ LOCATION	COURSE TITLE	SUBJECT AREA	INSTRUCTOR	REGISTRATION	FEE	AUDIENCE
October 18 London, Ont.	Infectious disease & infection control in the dental office	Infectious disease	Dr. G. Wysocki Dr. T. Dayley Dr. L. Yanover	Open	\$ 75	Dentists
October 19 London, Ont.	Advanced periodontics, oral medicine and oral radiology for the dental hygienist	Periodontics radiology, oral medicine	Dr. Sandhu Dr. Morrow Dr. Kogon	Limited (pre-requisite)	\$145	Hygienists
November 2 London, Ont.	Innovations in endodontics	Endodontics	Dr. W.M. Ben Johnson	Limited	TBA	Dentists Auxiliaries
November 2, 16, 30 London, Ont.	Restorative dentistry update		M. Suzuki	Open	\$ 75 (3 saturday sessions \$200)	Dentists Auxiliaries
November 28, 29, 30 Tampa, Florida	Symposium South Diagnosis, Delivery, Dilemma	Diagnosis, oral surgery, endodontics, prosthodontics, operative dentistry	Dr. Walker Dr. Gratton Dr. Gray Dr. McConnell Dr. Lapointe Dr. Brooke Dr. Wood	Open	\$525 \$200	Dentists Auxiliaries
December 12, 13, 14 London, Ont.	Crown & bridge Back to Basics	Crown & bridge	Dr. Gratton Dr. McConnell	Limited	\$600	Dentists
December 14 London, Ont.	Periodontics for the orthodontist	Periodontics	Dr. Wood Dr. Sandhu Dr. Morrow	Limited	\$195	Orthodontists
March 27, 28 London, Ont.	Optimal aesthetics The challenge of the '90s	Esthetics	Dr. Gratton Dr. Boksman Dr. McConnell Dr. Teteruck	Limited	\$550	Dentists
April 9, 10 London, Ont.	Prosthodontic aspects of osseointegration: A course for the general practitioner	Implantology	Dr. G. Zarb Dr. Charles	Limited	\$895	Dentists
April 4 London, Ont.	Periodontics for hygienists & the dentist — Part I	Periodontics	Dr. Morrow Dr. Sandhu		\$195 \$145	Dentists Hygienists

Continued on page 670

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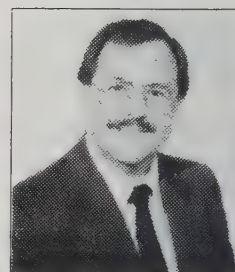
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Oct. 17 Halifax, N.S.
Oct. 18 Moncton, N.B.
Oct. 19 Saint John, N.B.
Oct. 21 Kitchener / Waterloo
Oct. 22 London, Ont.

Oct. 23 Windsor, Ont.
Oct. 24 Hamilton, Ont.
Oct. 25/26 Toronto, Ont.
Nov. 18 Toronto
Nov. 19 Mississauga
Nov. 20 Toronto

Nov. 21 Oshawa
Nov. 22 Kingston
Nov. 25 Vancouver
Nov. 26 Edmonton
Nov. 27 Calgary
Nov. 28 Victoria

Interview

Dr. Gerald Niznick — A Canadian Who Made a Difference

In November 1989, the Journal published the first instalment in a series of articles and interviews about Canadians who have made significant contributions to dentistry. "The Story of Silver Amalgam" highlighted the work of Dr. William Youdelis, who, with the help of David Innes, a young graduate student, developed a new dental amalgam that changed the face of the profession.

Subsequent features outlined the accomplishments of George Beaver, "The Birth of the Burr," February 1990; Dr. Dennis Smith, "Cementing the Future," September 1990; and Arthur Swingenberger, "Instrument Sterilization," March 1991.

The series continues in this issue through the following interview with Dr. Gerald Niznick, the originator of the Core-Vent system of osseointegrated implants.

Born in Fort Francis, Ontario, Dr. Niznick was awarded his DMD from the University of Manitoba in 1966. That was followed by a certificate in prosthodontics from the University of Southern California in 1967 and a M.Sc. in Prosthodontics from Indiana University in 1969.

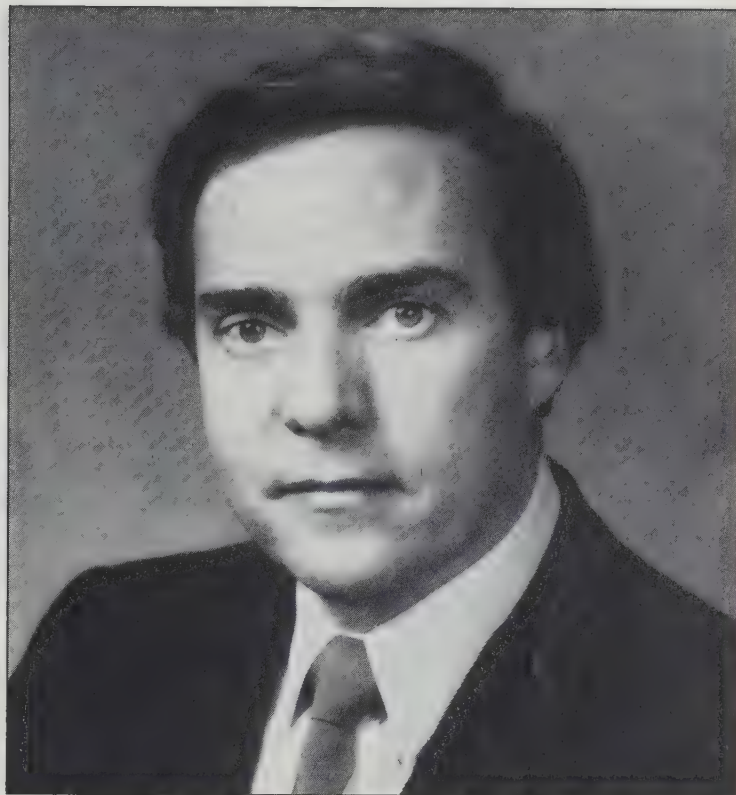
Three years later, after developing an interest in implantology, Dr. Niznick continued his training and began to work in the field. By 1982 he had developed and marketed the first Core-Vent implant system, which, along with a similar system developed by Brånemark in Sweden, has helped to revolutionize the practise of dentistry.

(Dr. Niznick was interviewed in Vancouver, B.C., February 23 during the Third Annual Pacific Implant Symposium. The interview was conducted by Dr. P. Ralph Crawford, the Journal's editor.)

Journal: Why and how did you get interested in implant dentistry?

Dr. Niznick: When I opened my prosthetic practice in Los Angeles in 1969, I found that many dentists were sending me their difficult denture cases and there was a limit to what I could do to satisfy the patients' needs using conventional procedures.

In 1972 I started to look around to see what was available in implantology. I took additional training and began to work with several implantologists. At that time, very few surgical specialists were involved in placing implants, so I eventually started to do the surgery myself — mainly so I could have control of the overall treatment. I was able to help many of the edentulous patients using the early implants, such as subperiosteals, but the surgery was rather invasive and the long-term predictability was questionable. In 1980 I started to develop a pure titanium, screw-type implant that could be placed in the symphysis of the edentulous jaw to stabilize an overdenture, similar to conventional therapy with retained lower cuspids. Through trial and error, it became apparent that these implants would only function free-standing if I could get them to ankylose (osseointegrate), and this was accomplished by avoiding the overheating of the bone during insertion and by not placing the implants in function for several months. By 1981 the design had evolved to a hollow-basket, screw-type implant made of titanium alloy for greater strength. The first Core-Vent system was sold in Montreal in June 1982.



Gerald A. Niznick, DMD, MSD
founder and president, Core-Vent Corporation
Encino, California

Journal: This was prior to your knowledge of Brånemark's studies?

Dr. Niznick: Yes. Dr. Brånemark's studies were not published in this country until July 1983. I went to the library at the University of Southern California and read about Dr. Brånemark's work for the first time in October 1982, however, and was very pleased to see that someone had done some long-term clinical research on two-stage titanium implants capable of achieving what I was calling ankylosis and Dr. Brånemark was calling osseointegration. Thus my 1982 article on Core-Vent in the *Journal of Oral Implantology* makes no reference to his studies, while my 1983 article in *Oral Health*, and all subsequent articles, did reference Brånemark's early work — published in Sweden — in order to take advantage of the connection between our osseointegrated implant systems.

Journal: What about the competition between you and the Nobel-pharma people? Some dentists are saying, "What Niznick has done is merchandize what Brånemark developed."

Dr. Niznick: Competition is always healthy. The consumer benefits from competition by rewarding the manufacturer that can provide the most innovative products and best service at the most reasonable prices. I believe that what the Core-Vent system brought to the profession in the early 1980s, more than anything else, was North American prosthetics and practicality — accessible to general

dentists as well as specialists — at a time when the fledgling industry was being overwhelmed by academic support for the Nobelpharma system. Time has certainly seen a more open-minded approach to implant options and I believe I have contributed significantly to that.

Journal: *What about the legal battles between Core-Vent Corporation and Nobelpharma?*

Dr. Niznick: This is not untypical in the business world. There have been several lawsuits between Core-Vent and Nobelpharma. In 1989, after almost three years of hassling back and forth, everything seemed to have been settled. As a result, Core-Vent dropped its challenge to Brånemark's patent pertaining to the surface of a dental implant and received a license. This allowed us to continue making the Swede-Vent implant, a clone of the original Brånemark, which is just one of the eight implant designs sold by the Core-Vent Corporation. All of the other implant designs are covered by patents that I have filed.



I would advise all dentists using implants to work in study groups and to be a continuous student, regardless of whether they are doing the surgery, the prosthetics or both.

Journal: *What is your share of the North American implant market?*

Dr. Niznick: According to the December 1990 *CRA Newsletter*, a survey of 10,000 readers revealed that 31 per cent of the dentists using implants preferred the Core-Vent system. This survey, and other reports by Bio-Medical International, have reported Core-Vent to be the most widely-used implant system in North America.

Journal: *How many implant systems are available in North America?*

Dr. Niznick: I would say six or seven of any significance, and by significance I mean those companies selling more than a million dollars worth of product in a year.

Journal: *If there are six or seven companies, aren't they all pretty much the same? If you can drive a Ford, surely you can drive a Chevy?*

Dr. Niznick: There is a certain amount of truth to that statement — given the fact that any of these implants will osseointegrate if you follow proper surgical techniques. Even the cost difference is not that significant among the four leading companies, exclusive of Nobelpharma. What separates the companies are the implant design options and packaging that they offer, and this affects the simplicity and predictability of the surgical procedures. Most companies provide only one design in one material. I have taken the multi-modal approach in an effort to match the design of the implant and the surgical protocol to the morphological differences that are present in the various anatomical locations. Further-

more, a very significant difference in implant systems is the design, strength and precision of the connection between implant and abutment. This can affect the dentist's ability to achieve the esthetic and restorative objectives that he promised the patient, and will be the determining factor in minimizing prosthetic maintenance problems.

Journal: *Let's talk about training or becoming adept at implantology. Your concept has been that any general practitioner could do it?*

Dr. Niznick: While there is no doubt that oral surgeons and periodontists have an advantage because of their added surgical experience and training, I would say that implant dentistry can be taught to any serious dentist. There is no point becoming involved unless you are going to be serious — you need to take ongoing training. I would advise all dentists using implants to work in study groups and to be a continuous student, regardless of whether they are doing the surgery, the prosthetics or both.

If the dentist is only going to insert a few implants per month, then perhaps he should work in a team approach with an oral surgeon or periodontist who is already involved in implantology. It just isn't economical to place implants unless your practice will support this type of treatment and provide you with the ongoing experience you need.

Journal: *What degree of difficulty do you assign to implantology?*

Dr. Niznick: The procedure can be as simple as doing a single-tooth root canal treatment, and probably as predictable — providing you properly select your case. If a dentist can reflect a mucoperiosteal flap, prepare a hole in bone to a depth line on the drill, and then push or screw an implant in while maintaining initial stability, then the implant will most likely osseointegrate if left unloaded for about three months.

Problems may arise if the dentist attempts more complex cases than his experience and training would indicate, or if the patient's treatment is planned without consideration for the general periodontal health of the remaining teeth or the occlusal scheme.

I would suggest that if a general dentist decides to work in a team approach with an oral surgeon or periodontist, he should select one who is knowledgeable and open-minded about all the current systems, with an understanding of the prosthetic limitations of the system he chooses to impose on the restorative dentist.

If I could give only a single piece of advice to a dentist treating an implant case, it would be to conduct full treatment planning and maintain proper records — consider the implant as an adjunct to good restorative dentistry, not as the end-all and be-all.

Journal: *What research projects are Core-Vent currently undertaking?*

Dr. Niznick: Thirty veterans administration centres in the U.S. have undertaken a multi-centre prospective study that will involve placing products in 680 patients. The study will cost \$23 million, with Core-Vent Corporation being the major contributor. It will compare the results obtained through the use of different designs and materials in the same jaw.

Journal: If you are funding the project, doesn't this lend itself to bias?

Dr. Niznick: I certainly hope not — that's not the purpose of research. The study will be completely independent of Core-Vent. Internal and external peer review committees have been appointed to ensure that the proper protocol is followed and the interpretation of the data is unbiased.

Journal: How much implant dentistry is being taught in universities?

Dr. Niznick: I am sure that it is mandatory for all oral surgery prosthetic and periodontal graduate training programs to include implantology in their curriculum. I do know that about 30 periodontal graduate programs in the United States are using Core-Vent systems, and I believe you will see more and more implant dentistry included at the undergraduate level.

Journal: During the implant symposium, considerable emphasis was placed on the use of CAT scans for implantology. What is your comment on this technique?

Dr. Niznick: While it is very exciting to look at a CAT scan and see all the details of the bone, I have not found it necessary in the placement of over 2,000 implants. I think good clinical judgment, backed up with panoramic radiographs and the other routine records, can overcome the requirement for an expensive CAT scan, not to mention the higher dosages of radiation involved. The key is to have a variety of implant diameters available to deal with areas of limited bone.



We are now at the second, or more mature level of marketing — the oral surgeons and periodontists are working in study clubs to encourage general dentists to diagnose and treatment-plan cases for referral.

Journal: What are the biggest problems you have seen or heard about in the implant field?

Dr. Niznick: I would say misdiagnosis. Some dentists see a space (in a patient's mouth) and want to put an implant into it without looking at the entire treatment. Nothing should be overlooked — the occlusal plane, periodontal health, opposing arch, drifting teeth — nothing.

If I could give only a single piece of advice to a dentist treating an implant case, it would be to conduct full treatment planning and maintain proper records — consider the implant as an adjunct to good restorative dentistry, not as the end-all and be-all.

Journal: Do you see anything on the horizon, in terms of materials, that is going to change the implant field drastically?

Dr. Niznick: No I don't. I think that the materials we have today — whether the implant is pure titanium, an alloy or HA (hydroxyapatite) coated work extremely well. They all seem to integrate, although the HA seems to give some advantage in more porous bone.

However, I think it is critical to select the appropriate diameter and length for the implant to ensure that it engages cortical bone during initial placement. This gives the stability needed to achieve osseointegration. I also believe that we are going to see less use made of cylindrical (bullet type) implants. Time should prove that there are advantages to increasing the surface area of an implant through the use of threads.

Journal: You recently opened a new plant in California.

Dr. Niznick: Yes, about 30 miles out of Los Angeles, where we employ approximately 85 people. We now have total control of all manufacturing, quality control and packaging under one roof.

Journal: How fast is implantology growing, and what do you see in the future?

Dr. Niznick: Between 1983 and 1989 there was an annual doubling of implant usage. I think what we saw in 1990, and continuing on into 1991, is a flattening of implant sales. I think most of the oral surgeons and periodontists that were going to get into the field have bought their systems.

We are now at the second, or more mature level of marketing — the oral surgeons and periodontists are working in study clubs to encourage general dentists to diagnose and treatment-plan cases for referral. Also, the general dentists who have been sitting on the fence — the more conservative types, who perhaps were working with a specialist in the area — are now starting to place implants themselves in the simpler cases.

What is really interesting is the growth of implant dentistry internationally. Our overseas sales have doubled in 1990, while the American market, in general, grew by only about 10 per cent.

Journal: Our last question. I have heard dentists say that Niznick has become a multimillionaire from implants. Is this true?

Dr. Niznick: Let's just say that through some of my efforts in the design of implants and the education of dentists, I have been able to provide thousands of dentists around the world with the opportunity to provide a higher level of service to their patients, bringing both financial and professional rewards to their practices. I would like to think that the profession and Gerry Niznick have both obtained some reward. Δ

While the Journal believes that Dr. Niznick has made a significant contribution to dentistry through his work in implantology over the last two decades, the interview published above does not constitute an endorsement of any particular product, material, system or device. Its intent is solely to entertain and inform the Journal's readers.

Editor's Note: Shortly after the above interview was conducted, Mr. John C. Miles II, the president of Dentsply International, and Dr. Gerald Niznick, announced that Dentsply would enter into the implant industry with the acquisition of a new Core-Vent division.

Although Dr. Niznick will not be associated with Dentsply's Core-Vent division, he will retain ownership of Core-Vent Bio-Engineering, Inc., which will be the exclusive supplier of implant products to Dentsply. Dr. Niznick will continue to focus his attention on implant research and development as well as maintain his lecturing schedule.

Complex Impressions Simplified with Copper Bands and Warmed Rubber Base

H. Rosen, DDS, MRCD(C)

The warmed rubber base, copper band impression technique is indicated where tray impressions for full crowns fail with gingival retraction and/or electrosurgery, or where difficulty is anticipated in capturing terminations of preparations with tray impressions.¹⁻⁹

These are usually clinical situations where access, dryness and visibility — necessary prerequisites for successful tray impressions — cannot be easily achieved (Figures 1-5).

Possible contraindications for tray impressions are the presence of gingival inflammation and/or gingival bleeding; the uncontrolled seepage of saliva; extensive subgingival decay and/or tooth fracture; tissue laceration from overzealous crown preparation; heavy accumulations of fibrous tissue which resists deflection; a large muscular tongue and heavy cheek musculature; a small oral orifice; patients with a gag reflex that is difficult to control; and uncooperative, medically compromised and aging patients (Figures 6-10, and 15-18). Each of these problems can be overcome, with perseverance and skill, employing conventional tray impression techniques. However, the price in stress for the dentist and suffering for the patient can be enormous.

Advantages of Copper Band — Warmed Rubber Base Technique

The modified impression technique outlined in this article combines the advantages inherent in the use of copper bands for the mechanical deflection of tissue with those of warm rubber base for accuracy and ease of handling.^{1-5,7-9} It provides a simple alternative for securing difficult impressions, with fewer attendant iatrogenic periodontal and pulpal sequelae.^{3,5} It also eliminates much of the anxiety associated with taking impressions for fixed prosthesis.

The modified technique is an improvement over the traditional copper band impression technique with modeling compound, because the material in the copper band is perfectly elastic when set, yet it possesses compressive qualities similar

to modeling compound when applied to the tooth. A cast made from such an impression can be interchanged with an adjusted cast made from a tray impression taken with any elastic impression material.¹

Another advantage of this technique is that the working time and setting time of the impression material can be reduced by mixing the material on a warm to hot glass slab. Such a reduction in working and setting time greatly reduces the possibility of impression distortion as the band is held in position for the material to set fully.

The band supports thin fragments of impression material as the impression is taken, thereby protecting against those fragments becoming lodged in the gingival sulcus, and also supports such fragments for more accurate cast pouring.⁶



Fig. 1. Good indication for tray impression with retraction. Shoulder preparations with rounded axio-gingival line angles just subgingival for collarless porcelain fused crowns. Healthy gingiva. Bloodless preparations. Good access.

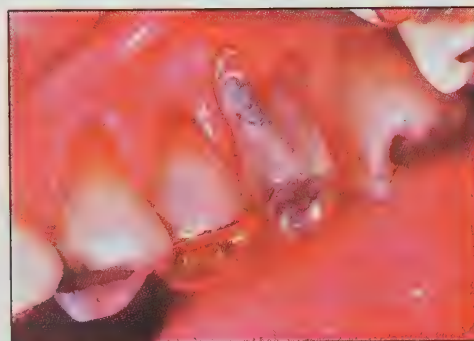


Fig. 2. Good indication for copper band impression with warm neoplex. Apically inclined chamfer and bevel subgingival preparation for porcelain fused crown on furcation involved 14 with severe buccal recession. Aging medically compromised patient. Access poor.

Disadvantages

Only one commercial product — Neoplex Regular Body (Columbus Dental) — has the characteristics required for this impression technique. Thirty years of clinical trials with a variety of new elastic impression materials, as they appeared on the market, have demonstrated that only Neoplex has the desired viscosity and compressibility when mixed, and elasticity when set, suitable for the copper band-warmed rubber base approach.

In addition, the technique only provides a precise impression of the prepared tooth, which is unrelated to the adjacent teeth. While it thus enhances and greatly simplifies the tray technique, it does not replace it.



Fig. 3. Master cast and porcelain fused crown for 14 reflect the detail captured in the copper band impression.



Fig. 4. Porcelain fused crown on 14 with subgingival metal collar. Full extension, edematous tissue at time of preparation and poor access present no challenge to the impression technique described.

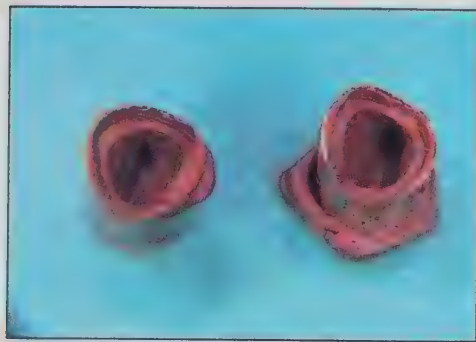


Fig. 5. Copper band modeling compound impressions of subgingival shoulder preparations for porcelain jacket crowns. Compound in infrabulge areas beyond finish lines either distorts or fractures. Casts made from several impressions of same preparation are not interchangeable.



Fig. 6. Copper band warm neoplex impression of subgingival shoulder and bevel preparation for upper lateral with severe labial recession. As with compound the band deflects tissue and fluid to enable the impression material to capture detail beyond finish lines. The band also supports and protects the impression material beyond termination of preparation for more accurate cast pouring. Casts made from several impressions are clinically interchangeable.

Sequence

A tray impression is first made with an elastic material of the dentist's choice. Reversible hydrocolloid, rubber base, addition reaction silicones, condensation reaction silicones and properly manipulated irreversible alginates are all acceptable for the purpose of making the initial, tray impression. (No gingival reaction is required with the tray impression, as the detail at the gingival margin will be captured with the copper band impression to follow.)

The cast poured from the tray impression is mounted on an articulator to be used for contact and occlusion adjustments, while the cast of the single tooth poured from the band impression becomes the master die.

A wax pattern fabricated on the working cast can be transferred to the master die for precise adaptation to the termination of the preparation. The gingival aspect of the working cast need only be ditched to allow for the additional length of the wax pattern and cast crown that have been fabricated on the master die.



Fig. 7. Copper band impression of subgingival chamfer preparation for trifurcation involved upper molar. Termination of preparation clearly visible in spite of difficult access and inflamed gingiva.



Fig. 8. Preparations on 7 and 8. Properly trimmed and festooned unannealed copper band seats freely to base of sulcus. A guideline is scribed on labio-gingival to enable proper seating of impression. Finger pressure results in blanching of gingiva.

The working cast remains intact. There is no need for time-consuming cast splitting, die separation and pin indexing. Transfer copings are not required, either.

In addition, the prepared tooth or teeth do not need to be absolutely dried before the impression is taken. Consequently, the incidence of post-operative complications due to overdesiccation of the pulp is greatly reduced.

Preparation of the Band

An unannealed copper band (Figure 8) is selected which has a diameter slightly larger than that of the cervical diameter of the prepared tooth. The band should be rigid, as an unyielding vehicle or matrix is desirable when dealing with elastic impression materials. The band is crimped, trimmed and festooned to follow the contour of the cervical finish line of the preparation. Most of the crimping can be done by hand, although band forming pliers (Peeso #118 or Dixon #118 and Reynolds #115) and band stretching devices (Silverman, Sweden #308) can facilitate this procedure. The trimming can best be done with curved surgical scissors (Misdorn-Frank, Germany) or curved crown and

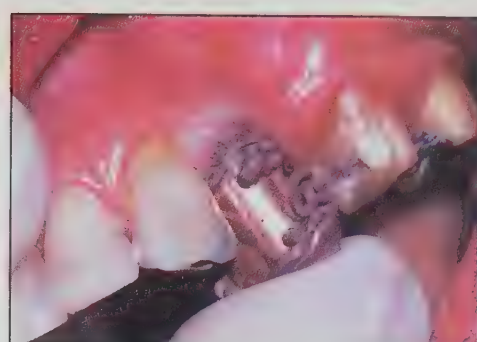


Fig. 9. Copper band which has been filled with warm neoplex of the proper viscosity is seated over the preparation on 7 to the base of sulcus. Note scribed guideline, blanching of gingiva and escape of viscous impression material through the minute retention holes.



Fig. 10. Copper band warm neoplex impressions of apically inclined shoulder and bevel preparations for 7, 8, 9, 10 and 11. Impressions precise in spite of subgingival instrumentation to refine finish lines.

bridge sissors (Healthco #415) and a torpedo shaped diamond point (Tri-Hawk F-5).

When the band is placed over the prepared tooth and gently pushed apically, it should enter the gingival sulcus, deflect the gingival tissue away from the termination of the preparation and stop at the base of the sulcus. When pressure is applied, blanching of the gingiva should occur around the periphery of the band. A guide line that follows the contour of the free margin of the gingiva can be scribed on the labial or buccal surface of the band with a diamond point. Such a line prevents the overseating or underseating of the band during impression taking (Figure 8).

Minute retention holes (approximately 20) are punched around the circumference of the band with a 8/0 Busch round bur. A sufficient number of these holes are needed to assure retention of the impression material in the band during withdrawal from the tooth or from the master cast.

Mixing the Warm Impression Material

A glass slab is heated by immersing



Fig. 11. Neoplex regular body rubber base impression material – Columbus Dental.



Fig. 12. Proper consistency of impression material at moment of impression. Material can be manipulated with fingers or lubricated gloves.

it in hot water for several minutes (Figures 11-14). The heat of the slab accelerates the polymerization of the rubber base impression material. As a result, the dentist can easily customize the working and setting time of the material by controlling the temperature of the glass slab. Room temperature and humidity also affect working and setting times.

(It is desirable for the dentist to train him or herself to work with a faster rather than a slower setting material. With too slow a set, it is possible to inadvertently move the band before the material is fully polymerized, resulting in an oversized die that will resist the transfer of a wax pattern made on the working cast.)

A small amount of Neoplex regular bodied, rubber base impression material is mixed on the warmed glass slab. The material will flow somewhat at first, but soon assumes a tacky appearance. It is loaded into the band with a paddle-shaped plastic instrument while it is in this tacky state. As it is being loaded, it assumes a doughy, mouldable consistency. The final loading can thus be performed with finger pressure, as the material will no longer stick to the skin (Figure 12). Rubber gloves should either be removed or lubricated for this procedure.

Seating the Copper Band

At this point the band is compressed over



Fig. 13. Four finger grasp on band for removal without distortion.

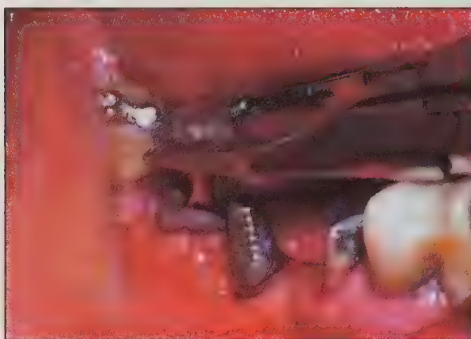


Fig. 14. Baade pliers grasp of retentive band over implant abutment post.

the preparation (Figure 9) and seated until the scribed lines correspond to their landmarks. Intermittent pressure should be applied to the band alone during the final seat, and then to the impression material and the band together to assure that the impression material is trapped between the band, the tooth and the base of the sulcus.

The gingival tissue around the periphery of the band becomes blanched and excess impression material ceases to escape from the sulcus, but instead runs out of the retention holes in the shape of finger like projections. At the same time, the band deflects gingival tissue from the finish line of the preparation, while the viscous impression material expresses fluids that may be present in the sulcus. It is held in position with light finger pressure until the material has polymerized on the glass slab.

The impression is removed by gripping the band in gauze with the index finger and thumb of both hands. Care is exercised not to squeeze the band (Figure 13). Retentive bands on long, narrow, parallel-sided preparations and implant abutment posts can be released easily with a Baade pliers (Henry Schein Inc.). Small holes are drilled on the facial and lingual band surfaces to engage the beaks. (An adjustable stop prevents band distortion (Figure 14).)

An accurate impression of the subgingival area is thereby achieved (Figures 6, 10 and 16). Through warming, the setting

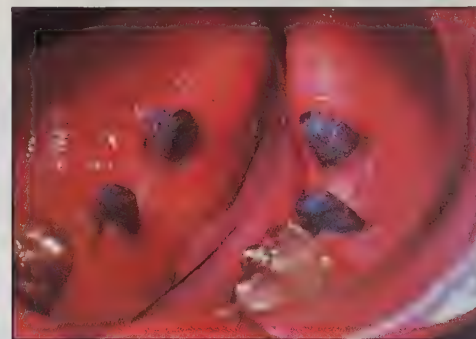


Fig. 15. Apically inclined chamfer preparations for three lower mutilated abutment teeth. Aging medically compromised patient who suffered from root caries and severe loss of alveolar bone. Diamond point curettage enabled extension of preparation beyond gingival seats of core build ups.



Fig. 16. Despite difficult access and previously mutilated abutments retainers of splint mirror finish line details visible in separated copper band warm neoplex impressions. Note rotated 20, hemisected 19, and furca of mesially inclined 17.

time has been reduced from eight minutes to two minutes. The polymerized material is not only elastic and dimensionally stable, but it also possesses better tear strength than other available elastic impression materials.

Precautions or Possible Contraindications

Single Tooth Restorations Between Unprepared Adjacent Teeth

With single-tooth restorations, the possibility exists for band distortion between the contacts of unprepared adjacent teeth. The distance between adjacent contacts cannot be less than the mesio-distal diameter of the crown or root plus the space occupied by the copper band at the level of the termination of the preparation. If it is, then the contacts on adjacent teeth should be adjusted and polished when the tooth is being prepared. This correction also permits easier seating of the final crown.

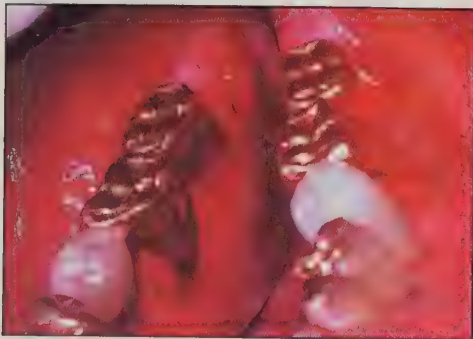


Fig. 17. Favorable tissue response two years after termination of restorations in spite of diamond point curettage and termination of preparations close to junctional epithelium. Precise fit results in favorable shrinkage and remodeling of tissue, while crown margins usually remain subgingival.

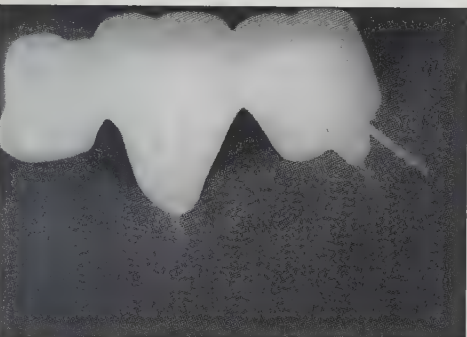
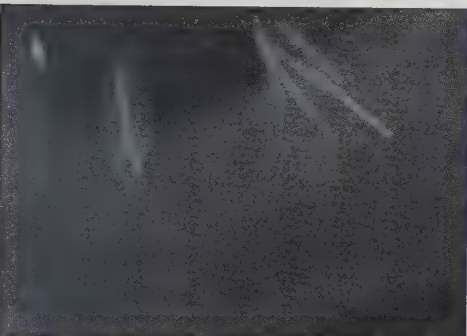


Fig. 18. Radiographs before and after confirm predictability of the technique. Tray impressions with retraction or electrosurgery would have been most challenging without post-operative sequelae.

Partial Coverage Restorations

Preparations for partial coverage restorations with intracoronal retention require less tooth reduction and less subgingival extension, resulting in infrabulges below the finish lines and heights of the contour. Less space exists to seat and remove the band without interference. With partial coverage preparations, a double mix impression technique is therefore required, in which light-bodied impression material captures the detail in line angles, pins and grooves. More force is required to remove the band from the intracoronal retentive areas and infrabulges of the tooth, and overzealous finger pressure can cause band distortion.

In both of these instances, conventional tray techniques present little or no special challenge, and there is little or no need for copper bands.

Master Cast Fabrication

Absolute precision is as important in the fabrication of the master cast or die as it is in achieving the impression. The final trimming and marking of the die should be performed by the dentist rather than by the technician.

Excess impression material is peeled and trimmed away from the periphery of the copper band. A masking tape ring is formed around its apical portion to provide a convenience stem that is approximately 20 millimetres long.

The die stone should be mixed according to the directions of the manufacturer. Small increments are teased down one wall of the masking tape ring with a brush or small spatula, being careful not to trap air inside the cast, while the band is held on a vibrator.

When the die stone is fully set (30 minutes) the masking-tape ring is removed, excess die stone is trimmed off, and the die is separated. The finish line is carefully exposed by trimming away excess stone with a heatless stone or abrasive rubber wheel.

A sharp-push gold knife can be used in critical areas to enhance this exposure. The line is highlighted in pencil and a ditch is cut one mm below it around the periphery of the die. A torpedo-shaped diamond point can be used for this procedure (Figure 3). The surface of the die is then treated with a layer of cyanoacrylate, being careful not to allow the material to pool in line angles as it is teased into place with a jet of air. The cyanoacrylate adds no appreciable thickness to the preparation, but provides a more resilient, durable surface.

Die spacers can be added where desired for long retentive preparations on all surfaces short of the margins.

Conclusion

A technique has been presented for providing excellent impressions with consistency and predictability where most conventional tray methods alone may fail. Minimal stress is induced for both the dentist and the patient. The armamentarium is simple and inexpensive, and postoperative periodontal and pulpal sequelae are practically non-existent. Δ

Dr. Harry Rosen is a professor and the director of graduate prosthodontics at McGill University in Montreal.

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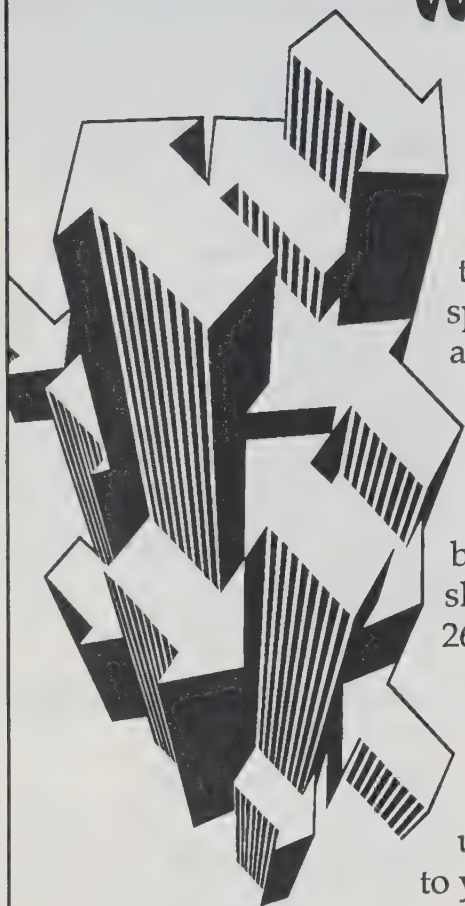


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References

1. Rosen, H. A modified rubber base impression technique. *J Can Dent Assoc*, Vol. 29, No. 11, 1963.
2. Kapin, S.H. and Schoolnik, P.R. Compound-copper band impressions: how and why. *Quintessence Int*, Dec;10(12):23-30, 1979.
3. Modica, R. and Mainoldi, G. Secondary softening of modeling compound for copper band impressions. *J Prosthet Dent Mar*;49(3):361-2, 1983.
4. Fitzig, S., Feder, D., Marshak, B. and Orstein, M. An improved copper band impression technique. *Quintessence Int Dec*;16(12):851-3, 1985.
5. Ruel, J., Schuessler, P.J., Malament, K. and Mori, D. Effects of retraction procedures on the periodontium in humans. *J Prosthet Dent*, Nov; 44(5):508-15, 1980.
6. Gentleman, L., Nathanson, D., Shklar, G., Brathwaite, W.J. Jr., Darmiento, L., Levine, P. and Judes, H. Preliminary evaluation of the histotaxicity and radiopacity of lead-containing elastic impression materials. *JADA Jun*;96(6):987-93, 1978.
7. Kimmelman, B.B. and Lerman, H. Impressions of single preparations using copper band-shell. *J Prosthet Dent* 26:154-8, 1971.
8. Darby, H. and Darby, L.H., III Copper-band gingival retraction to produce void-free crown and bridge impressions. *J Prosthet Dent* 29:513-6, 1973.
9. Stern, N. A band rubber-base impression technique for fixed restorations. *J Prosthet Dent* 26:491-96, 1971.

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The Maintenance of Osseointegrated Implants

L.D. Carlson-Mann, SDT, RDH
C.G. Ibbott, DMD, FRCD(C)

A professional providing maintenance therapy to an implant patient must fully understand the procedures required to maintain tissue health around implant sites and associated prostheses.

Today, the vast majority of implants are designed to promote osseointegration, which, according to Brånemark, is "a direct connection between living bone and a load-carrying endosseous implant at the light microscopic level." The practitioner must, therefore, place the implant in the patient's jaw in a manner that will promote the development of a strong implant-bone connection.

This implant-bone connection differs from the connection found between a natural tooth and bone — where a fibrous periodontal ligament exists between the tooth and the bone — although the gingival sulcus and the bacterial flora around the implant abutment are similar to those surrounding natural teeth. Furthermore, an attachment between the surface oxide layer of a titanium abutment and the adjacent epithelium is frequently found. This attachment appears to be mediated by a glycoprotein similar to the one that exists between the epithelium and a natural tooth.

There is, however, some histologic evidence to indicate that the connective tissue fibres adjacent to titanium implants are tightly apposed to the titanium abutment without having an absolute biologic attachment.¹ The epithelium and connective tissue normally act as a barrier to the external oral environment. But bacteria can attach to the implant surface, causing gingival inflammation and in some cases "peri-implantitis," which is a major cause of failure in all coated implants.² The microflora associated with peri-implant disease is similar to that found in periodontal disease patients, and a positive correlation has been found between pocket probing depth and gingivitis severity.^{3,6}

In most cases, implant procedures are carried out using the team concept, which involves a surgical, restorative, technical and hygiene professional. If any member of the team performs inadequate work, implant failure can result.

While implants are beneficial to both edentulous and partially edentulous



L.D. Carlson-Mann and C.G. Ibbott

patients, the prosthetic demands are more difficult for the partially edentulous patient. Problems such as axial inclination, coronal form, embrasure space, and thin versus thick periodontium must be addressed.

In this article, we will consider only the osseointegrated implant, with emphasis on the following case types: edentulous bone-anchored fixed bridge, overlay prosthesis, and implant-supported fixed partial dentures.

The actual cases examined are not representative of text-book laboratory work. However, cases involving poor implant placement and less than ideal laboratory work are more prone to complications and will likely require more maintenance.

Records

For the purposes of our study, we chose to use the Brånemark record-keeping system, Periimplant Maintenance Record.® Seven "signs" of implant health were investigated and recorded.

1. *Radiographs:* Periapical radiographs are an essential tool for diagnosing

implant problems. Right-angle radiographs taken with Masel X-ray holders are the method of choice, in our opinion. Vertical bitewings are also helpful when comparisons of implant bone height are made from initial reference radiographs. Radiographs are also critical during the abutment-connection procedure. Failure to inspect for a proper connection can result in an improperly seated abutment, and can lead to complications.

Strid and Hollender report that 0.45 millimetres of coronal bone may be lost in the first year following implant placement and 0.06 – 0.08 millimeters per year after initial bone loss has occurred. If the rate of bone loss is greater than expected, it may be due to:

- a) occlusal interferences
- b) fracture of the abutment or implant
- c) peri-implantitis (an inflammatory problem found around dental implants that mimics periodontitis)
- d) a peri-implant radiolucency (a radiolucent space surrounding the implant/bone interface) which indicates a failed implant.⁴



Fig. 1. Overlay prosthesis with 3 abutments exhibiting gingivitis and gingival hyperplasia.



Fig. 2. After treatment with oral hygiene instruction and mechanical debridement.



Fig. 3. Overlay prosthesis with 3 abutments exhibiting gingivitis and lack of keratinized tissue.



Fig. 4. After pocket elimination and gingival extension surgery.

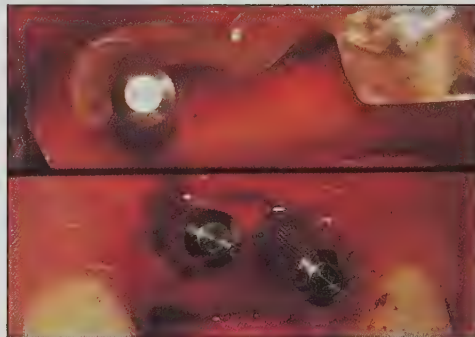


Fig. 5. Top: Proper placement of implant in bone using surgical stent. Bottom: Placement of implants with no regard to esthetics or restorative demands.



Fig. 6. Top: Implants surrounded by keratinized tissue. Bottom: 'Mushy' tissue around angulated abutments which were not ideally placed.

X-rays should be taken at every recall examination for the first 18 months and then every year thereafter. Periapical films should be taken more frequently if there is clinical evidence of disease surrounding the implant.

2. **Sound:** A healthy osseointegrated implant, when tapped with a metal instrument (eg. mirror handle or dissector), should produce a definite ringing noise. This ankylosed sound indicates that the implant is integrated with the bone. If a dull thud occurs, with or without patient discomfort, this usually indicates osseointegration. In some cases, the overlying prosthesis must be removed to test the implant sound, which is not always possible at every recall appointment.

Siemens now has a new instrument designed to test osseointegration. The Periotest[®] applies a standardized force to the implant to detect early implant failure, measures occlusal load and overload, and provides objective documentation, which can be placed in your patients' records.

3. **Probe:** The probing of dental implants is still controversial. Questions remain regarding the biological seal, or the direct connective tissue interface, and there is some concern that probing may strip the epithelial attachment.

Newman et al³ indicate that it is important to monitor implant health. However, the probing depths of implants are not necessarily as important as they are when caring for natural teeth. Often, abutment designs and prosthetic superstructures prevent accurate probing measurements and it is impossible to position the probe tip parallel to the long axis of the abutment or to reach the apex of the pocket. The probe of choice is a flexible plastic probe, which protects the implant from scratching.

Deepened pockets are always found in failing implants. However, this fact alone does not indicate that an implant is failing. Tissue thickness can complicate probing depths, and increased probing depths should thus be of greater concern than absolute probing depths. Greater emphasis should also be placed on bleeding, tissue tone, consistency, and retractability during probing as opposed to probing depth.

4. **Gingival bleeding, tissue tone, consistency, retractability, plaque and calculus:** All of these factors are equally important with regards to osseointegrated implants as they are for natural teeth. Plaque accumulation is the underlying cause of any inflammatory tissue response. Plaque will form

around the abutment (depending on the implant design, the abutment may be supra or subgingival). If this plaque is allowed to grow freely it will soon resemble the bacterial flora associated with gingivitis and/or periodontal disease. It is reported that bacteria does not adhere as easily to the titanium post as it does to the surface of natural teeth and that the plaque takes longer to form. If plaque and/or calculus formation occurs, gingivitis or conditions similar to periodontitis (peri-implantitis) may negatively affect the successful long-term survival of the implant.³

During the probing of a healthy implant site, there should be no bleeding and the tissue color should be similar to that found around a healthy tooth. The ideal tissue tone around implants should be a tight band of keratinized gingiva. Implants can survive without this thick band of tissue, although they tend to be healthier when it is present, and keratinized tissue does enhance esthetics.

5. **Occlusion:** Occlusion may be the primary cause for implant failure, and should therefore be checked and verified by the restorative dentist. Implant failure after osseointegration may be the result of either occlusal overload or bacterial infection. The restorative den-



Fig. 7. Proper radiograph of implant supported fixed partial denture.



Fig. 10. Right: Plastic probe. Left: Tapping for sound.

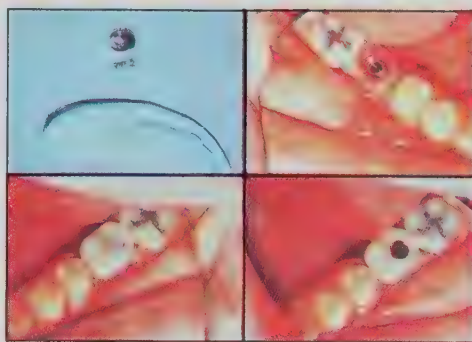


Fig. 8. Bottom right: Single tooth implant. Bottom left: Implant fixture. Top right: Crown screwed to position. Top Left: Light cured material to cover screw hole.



Fig. 11. 3i Gold tipped Implarette® for scaling abutments.

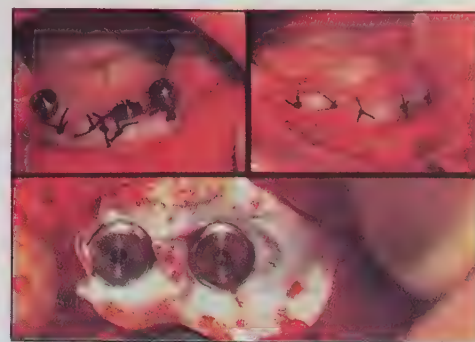


Fig. 9. Top right: Free gingival grafting before implant placement. Top left: Grafting at time of implant uncovering. Bottom: Gortex® used to augment bone over implant sites.

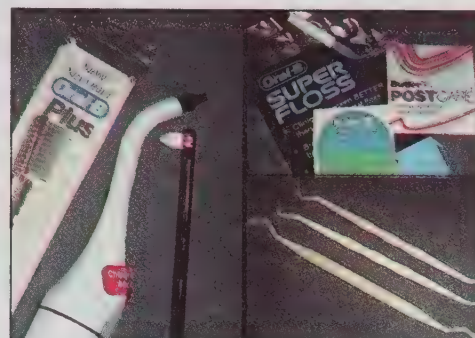


Fig. 12. Right: End tuft, Hand brush, Rota-dent®. Left: Post-Care floss®, Super-floss®, Floss threaders and plastic scalers.

tist is responsible for reducing the occlusal stress and/or adjusting the superstructure design.

6. **Prosthesis (superstructure evaluation):** The hygienist can be responsible for checking the prosthesis during regular maintenance appointments. Current practices recommend the removal of the prosthesis at least once a year if the implant abutments cannot be scaled with the prosthesis in place. During the removal, absolute abutment mobility can be checked. Since there is no periodontal ligament associated with osseointegrated implants, there should be absolutely no mobility around the implant. Mobility can be difficult to detect, however, and failing implants do not become mobile until a critical amount of bone has been lost. At this stage, there is no treatment to reverse this phenomena.

At subsequent appointments, when the superstructure is not removed, mobility of the fixture and/or the abutment is even more difficult to detect.

If the prosthesis is loose, check the abutment screws for looseness or breakage. If there is saliva percolation (little saliva bubbles) between the abutments and the prosthesis, the abutment screws need tightening or the gold screws need replac-

ing. These small corrections can prevent implant failure.

7. **Microbiology:** Very little research has been done on monitoring the bacteria around osseointegrated implants. Studies indicate that the composition of the subgingival plaque associated with dental implants is comparable to the composition of the plaque found with natural dentition.

- a) **Stable implants:** Gram-positive organisms dominate and a few mobile bacteria and spirochetes are present.
- b) **Failing implants:** Gram-negative rods, black-pigmented bacteroides. Surface translocating bacteria, *actinobacillus*, *capnocytophaga*, fusiforms, and spirochetes.³

Newman et al³ note that in the case of partially edentulous patients, the bacteria associated with peri-implant pockets could possibly enter the sulcular area of natural teeth. The opposite is also true — the periodontal pockets of natural teeth could transfer bacteria to implants. Thorough periodontal treatment should therefore be completed before implantation.

Scaling

The principles involved in scaling implants differ from those used in scaling

natural teeth. The Brånemark guidelines suggest that the practitioner should avoid applying excess pressure when scaling, as superficial layers of calculus are normally not too difficult to remove from implant abutments. "If no subgingival calculus is present, avoid inserting the scaler deep into the gingival pocket around the abutment."⁵

Stainless steel and titanium instruments are not recommended for scaling implants and abutments. The surface of the titanium implant can be easily scratched by metal scalers, which can lead to greater plaque and calculus formation.⁵ A number of microorganisms may also accumulate on the rough areas created by the use of these instruments, leading to inflammation.³ The use of ultrasonic devices for this purpose is also not recommended.^{3,5}

The scaling instruments of choice are made of plastic, such as those designed for the Brånemark System®. If plastic scalers are not available, a Teflon or wooden instrument can be used. Half of a round, pointed toothpick — placed in the hole at the end of the proxabrush handle — can be an effective scaler. Caution is advised when using a wooden toothpick as a scaler, however, as breaking and splintering can occur.

Implant Innovations has recently



Fig. 13. Overlay prosthesis (similar to edentulous bone-anchored fixed bridge): Top right: Hand brush. Bottom right: End tuft brush. Top left: Plastic scaler. Bottom left: Proxabrush®.

designed a special gold alloy set of scalers ($7/8$, $11/12$, $13/14$ Gracey configuration) for use on dental implants. The gold alloy is reported to be softer than titanium and therefore will not alter or damage the implant abutment's surface. Unpublished studies have found that the Implanette Scaler® is more rigid than plastic scalers and more effective in the removal of calculus without causing any detectable damage.

Polishing

Polishing with flour of pumice, or using a cavitron or air polisher, is too abrasive for titanium implants and is not recommended. A mild abrasive paste (made of either aluminum or tin) used on a prophy cup or rubber point works quite effectively to remove plaque and discoloration.⁵ This method can be used on both the bridge-work and abutments at recall visits.

Studies show that the use of the Cavi-jet® air polisher on implants and implant abutments causes discoloration and corrosion. However, in unpublished studies, the device's use did not result in an alteration of the implant's titanium surface. It is the opinion of these clinicians, however, that operator error during the use of a Cavi-jet® air polisher could possibly cause the biological seal (sulcus) to be perforated, and the device's ultrasonic motion has the potential to adversely affect osseointegration. Obviously, more conclusive studies need to be completed in this area.

Buffing inserts, "shoe-shine style," with strips of 2X2 gauze or Superfloss are also quite effective.

Patient Instruction

The information and instructions given to patients should be individualized, according to the position of the abutments, the abutment length, the bridge or denture design, the surrounding anatomy and the general oral health of each patient.

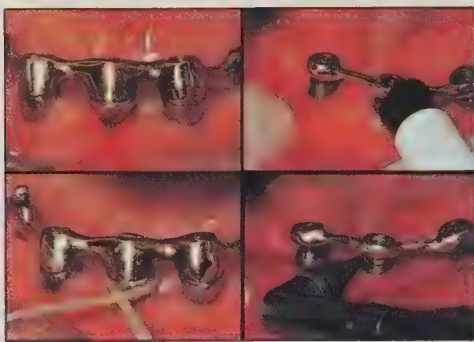


Fig. 14. Top right: Rota-dent®. Bottom right: Rubber prophy point. Top left: Post-care®. Bottom left: Superfloss®.

Encourage patients to establish a daily routine. It is important to remember that most patients have lost their natural teeth through neglect; changing their oral hygiene habits may be a difficult task.

Patient education should include strict instructions to never use a hard toothbrush, safety-pins, paper clips or other metal objects to self-clean the implants or inserts.

A number of items may be required for the patient to achieve good oral hygiene.

1. Soft toothbrush (regular or a two-row sulcular). These brushes work well on the facial portion of the abutments and the gingival side of the bridge.
2. Interdental brushes (proxabrush traveler with nylon-coated wire). The new nylon-coated wires may cause less scratching to the abutments than the original metal-coated wires. By angling the proxabrush, most of the interproximal lingual surfaces of the abutments can be cleaned.
3. End tuft (tapered or flat). These brushes can clean the lingual surfaces of the abutments, which have limited accessibility when the bridge or denture is attached. The handle may be custom bent for easier use by each patient.
4. Dental floss (regular waxed or unwaxed, Superfloss®, dental tape, gauze, Implant Innovations G-Floss® or Butler's Post-Care® plastic reusable floss, in either regular or thin modified, and specially designed for implants). The patient should be instructed to use more of a "shoe-shine" motion when flossing.
5. Disclosing tablets. As mentioned before, a number of implant patients have lost their natural teeth through neglect. Daily cleaning of dental implants may be difficult for them, initially. Disclosing solution can help patients evaluate their home-care techniques.
6. Dental mirror. Implants are not easy to

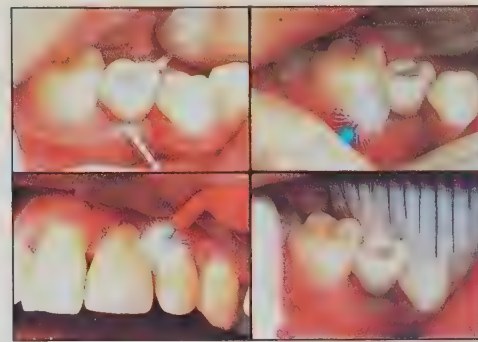


Fig. 15. Single tooth procedure similar for implant supported fixed partial. Top right: Floss. Bottom right: Proxabrush®. Top left: Proxabrush®. Bottom left: Hand brush.

keep clean. With the aid of a dental mirror, patients can see the actual shape of the implant abutment.

7. Antimicrobial solutions (chlorhexidine). Some dentists feel that chlorhexidine solutions cause staining on the implant bridges and should not be used. Others feel that the response achieved by the antimicrobial agents is so beneficial that the staining is secondary. If chlorhexidine is used, rinsing is not necessarily the method of choice. Dipping a toothbrush in a chlorhexidine solution may be equally as beneficial and may not cause the same amount of staining.
8. Rotary toothbrushes (Rota-dent®). The Rota-dent toothbrush is available only through dental offices and not in retail outlets. Therefore, providing this brush to patients entails an added responsibility for the dental offices involved. The Rota-dent brush has been shown to be an effective and easy way to clean implants, however. The motion of this brush is similar to the hygienist's polisher, and different brush attachments are used for each surface. The use of a rotary brush that has been dipped in an antimicrobial solution may also be beneficial.

It is important to remember that each patient is an individual and, therefore, not every item listed above will be necessary for each patient. It is the hygienist's responsibility to choose the appropriate aids to suit each patient's needs.

The patient will need repeated demonstrations, as well as verbal instructions, in order to understand the appropriate use of each tool. Once again, since titanium is softer than a natural tooth, the risk of damaging the abutment with hard brushes and abrasive toothpaste is higher. Therefore, it is recommended that soft brushes and less abrasive toothpaste be used.

Partially, as well as fully edentulous patients should be seen on a regular three-

month recall basis for the first 18 months after the fully-restored implant procedure, in accordance with the Brånemark System® Clinical Guidelines. Ideally, the recall intervals after that initial period should maintain the three-month frequency. However, the recall should be left to the individual operator and the patient, depending on the progress, and could possibly extend up to four or six months.

Given the amount of research that has been done on implants, and the wealth of information that is now available to properly maintain them, there is no reason that a successfully osseointegrated implant should not last a lifetime. Δ

Dr. Ibbott and Ms. Carlson-Mann are in a private periodontal practice in Regina, Saskatchewan.

The mention of brand names in this article does not constitute an endorsement of these products by CDA or the Journal.

References

1. Donley, Gillette. Titanium Implant-Soft Tissue Interface: A review. *J Periodont.* 62:155-159, 1991.
2. Langer, B. Nobelpharma TEAM day, May 17, 1991, Toronto, Ontario.
3. Newman, M.G., Flemming, T.F. Periodontal Considerations Of Implants and Implant Associated Microbiota. *J Dent Ed* 52:12, 1988.
4. Langer, B., Sullivan, D.Y. Osseointegration: It's impact on the interrelationship of periodontics and restorative dentistry; part I. *Periodont Rest Dent* 9:2, 1989.
5. Clinical Guidelines For Hygiene Maintenance Of Patients Treated With The Brånemark System® 1989.
6. Adell, R., et al. Marginal Tissue Reactions At Osseointegrated Titanium Fixtures. I. A Three year Longitudinal Prospective Study. *Int J Oral Surg* 15:39-52, 1986.
7. Brandes, R., et al. Clinical-Microscopic Observation Of Ligature Induced "Periimplantitis" Around Osseointegrated Implants [Abstract #1397]. *J Dent Res* 67:287, 1988.
8. Mombelli, A., Van Oosten, M.A.C., Schurch, E., et al. The Microbiota Associated With Successful Or Failing Osseointegrated Titanium Implants. *Oral Microbiol Immunol* 2:145-51, 1987.
9. Balshi, T. Hygiene maintenance procedures for patients treated with tissue integrated prosthesis (osseointegration). *Quintessence Int* 17:95-102, 1986.
10. Thomson-Neal, D.M., Evans, G.H., Meffert, R.M., Davenport, W.D. An SEM evaluation of various prophylactic modalities on different implants. *Int J Perio Rest Dent* 9:301-311, 1989.
11. Newman, M.G., Kornman, K.S. Antibiotic/Antimicrobial use in dental practise. *Quintessence Int.* 16:187-200, 1990.
12. Rapley, J.W., Swan, R.H., Hallmon, W.W., Mills, M.P. The surface characteristics produced by various oral hygiene instruments and materials on titanium implant abutments. *Int J Oral Max Implants* 5:47-51, 1990.
13. Wilson, T.G., Jr. Dental Maintenance for Patients With Periodontal Disease. *Quintessence Ch* pp. 191-196, 1989.

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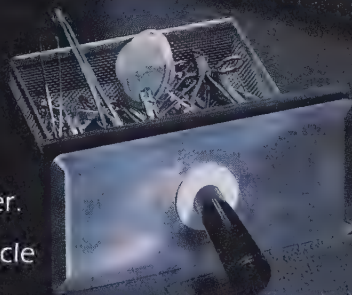
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Peel bond strengths of five impression material tray adhesives

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ABSTRACT

The peel bond strengths of five impression materials and their tray adhesives to a perforated and non-perforated test surface were measured and the results were compared using a one-way ANOVA and Student Newman Keuls Multiple Range Test at $p \leq .05$ level of significance. The auto-mix addition reaction silicone material Extrude produced the greatest peel bond strengths on both the non-perforated test surface (10.88 kg/cm^2), and on the perforated test surface (15.88 kg/cm^2). These bond strengths were greater than those obtained from the polysulphide and polyether materials used in the study. Using the perforated test surface significantly increased the peel bond strength for all the materials tested. It was concluded that in order to achieve the maximum adhesive bond, impression trays should be perforated. The greatest peel bond strengths were obtained using Extrude medium-body impression material.

SOMMAIRE

On a mesuré la résistance au détachement de cinq matériaux d'empreinte et leur force d'adhésion à des porte-empreintes perforés et non perforés, puis on a comparé les résultats à l'aide d'une analyse de variance à un critère de classification et une épreuve d'étendue multiple de Newman-Keuls au seuil de signification de $p < 0,05$. C'est le matériau au silicone Extrude à polymérisation par addition qui possède le pouvoir adhésif le plus grand à une surface non perforée ($10,88 \text{ kg/cm}^2$) et perforée ($15,88 \text{ kg/cm}^2$). Ces taux sont supérieurs à ceux qu'on a obtenus avec les matériaux au polysulfure et au polyéther utilisés pour les fins de cette étude. Une surface perforée a donné un pouvoir adhésif plus grand à tous les matériaux mis à l'essai. Aussi a-t-on conclu que, pour obtenir un pouvoir adhésif plus grand, les porte-empreintes doivent être perforés. C'est avec Extrude à consistance moyenne qu'on a obtenu le plus grand pouvoir d'adhésion.



Fig. 1 Adhesive applied to one half of test block.

A tray adhesive is usually supplied with every elastomeric impression material. The adhesive should prevent the impression material from separating from the tray, since this can adversely affect the accuracy of the impression. Previous studies have reported differences in the bond strengths of several tray adhesives.¹⁻⁴ In 1982, Phillips⁵ stated that, in general, the polysulphide and polyether adhesives were satisfactory, but that the addition silicone adhesives were less effective. Recently, some of the previously tested impression materials have been modified and the auto-mix systems have become popular, making it necessary to re-evaluate the bond strengths of the adhesives currently available.

Several tests have been used to measure the bond strengths of the adhesives and the results have been reported as either tensile, shear or peel bond strengths.¹⁻⁴ Grant and Tjan⁶ claim that a peel bond test is more clinically relevant as it closely simulates the clinical situation when an impression is removed from the mouth.

This study measured the peel bond strengths of tray adhesives to a perforated and non-perforated test surface. Three auto-mix addition reaction silicone impression materials, an improved polyether, and a polysulphide impression material were tested and compared.

Materials and Methods

Five impression materials and their adhesives were used in this study, and their



Fig. 2 Sequence showing test block in jig, cloth strip in impression material, glass slab on top of impression material, underneath of test block showing impression material in the perforations.



Fig. 3 Acrylic block and impression material attached to vice grip of Instron Testing Machine.

product numbers are listed in Table I. Fifty acrylic blocks two centimetres wide, four centimetres long, and five millimetres thick were made using autopolymerizing acrylic (Trayresin, Dentsply International Inc., York, PA). A mold was used to ensure that each block was the same size, and the test surface on the acrylic blocks was sanded flat on an 80 grit disc to produce a uniform test surface.

The 50 blocks were allowed a minimum of 48 hours to cure before they were randomly divided into five groups of

10 blocks. The blocks were measured and a line was drawn to divide each one in half, producing two test surfaces of two cm by two cm square. One coat of tray adhesive was applied to one half of the block (four cm²) using the brush supplied by the manufacturer (Fig. 1). The adhesive was allowed to dry in air for a minimum of 15 minutes (maximum 18 minutes) before the corresponding impression material was applied. A jig was used to ensure that an equal thickness of impression material was applied to each acrylic block. In order to attach the impression material to a vice grip, a strip of cotton cloth was sandwiched into the impression material when the specimen was prepared. The cloth was placed in the middle of the impression material so that the cloth did not contact either the acrylic block or the glass slab on top (Fig. 2). The glass slab (of 550 grams mass) was placed over the impression material, which was left to polymerize at room temperature 23°C ± 1°C for at least 10 minutes (maximum 12 minutes) before testing. The polysulphide material was allowed to polymerize for 15 minutes. The test blocks were placed at 25 degrees to the horizontal plane directly under the point of attachment of the vice grip on an Instron Model 1000 testing machine (Instron, Canton, MA). The Instron applied a tensile load at a crosshead speed of 200 mm/minute to the impression material to produce a peeling force between the acrylic block and the impression material (Fig. 3). The peak bond strength was recorded as a digital readout and on chart paper. The specimens were examined and the mode of failure was recorded as either adhesive (between the impression material and the acrylic block), or cohesive (within the impression material).

After the bond strengths had been recorded for the 50 specimens, all the old impression material and adhesive were removed and the acrylic block was sanded flat to produce a uniform test surface. Eight holes, two millimetres in diameter, were placed one centimetre apart in each block. The holes were drilled using a template to ensure uniformity among all the blocks. Adhesive was placed on one half (four cm²) of the perforated acrylic block, but none on the other half (Fig. 4) and the experiment was repeated.

The results were tested using a one-way ANOVA to determine if differences existed in the bond strength between the impression materials or the perforated and non-perforated test blocks. Student Newman Keuls Multiple Range Test was then used to indicate which impression materials or test surfaces were significantly different ($p \leq 0.05$).

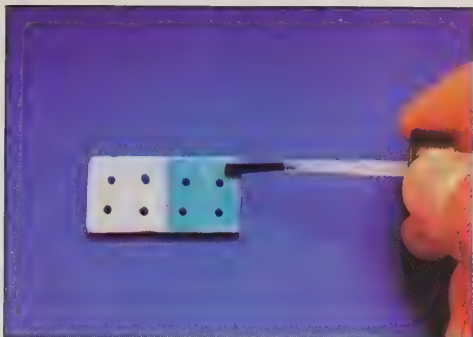


Fig. 4 Perforated acrylic test blocks with adhesive placed on one half of block.

Results

The one-way ANOVA indicated that at $p \leq 0.05$, significant differences existed in the bond strengths of the impression materials and between the perforated and non-perforated test surfaces. Student Newman Keuls Multiple Range Test revealed that, on the non-perforated test surface, using adhesive only, the auto-mix addition reaction silicone impression material, Extrude, produced the greatest mean peel bond strength of 10.88 kg/cm² (Table II). The polyether impression material, Impregum F, produced the lowest peel bond strength of 2.35 kg/cm² ($p \leq 0.05$). The mode of adhesive failure was also different for the five impression materials. For Extrude, 80 per cent of the failures were cohesive within the impression material (Fig. 5). In contrast, 100 per cent of the Impregum F samples failed adhesively (Fig. 6), with the material pulling cleanly away from the acrylic surface (Table III).

Use of the perforated acrylic surface and adhesive increased the bond strength of the



Fig. 5 Example of cohesive failure in Extrude impression material.

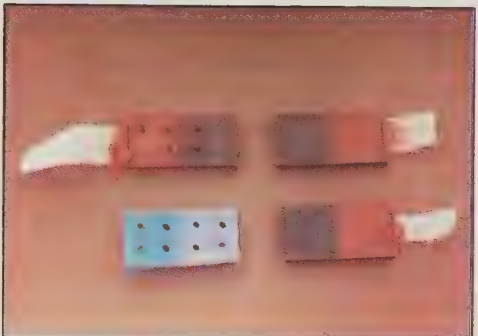


Fig. 6 Example of adhesive failure in Impregum F impression material.

impression materials. Extrude again produced the greatest mean ($p \leq 0.05$) peel bond strength of 15.58 kg/cm² and Impregum F the lowest bond strength of 5.93 kg/cm² (Table II). The mode of adhesive failure using the perforated blocks was similar to the results obtained using the non-perforated blocks, except for Reprosil, where 100 per cent of the failures were cohesive failures (Table III).

For all the impression materials except Impregum F, the results obtained from the

TABLE I

Impression Materials and Adhesives

	Batch Number		Adhesive
Polyether			
	Impregum F	1102	Base
	ESPE, Don Mills, Ont	0267	Catalyst
Addition Reaction Silicone			
	Extrude	91219	61389
	Medium Body		
	Kerr, Romulus, MI		
	Express	9UT1X65	7D
	Medium Body		
	3M, St. Paul, MN		
	Reprosil	051988	050589
	Medium Body		
	Caulk/Dentsply, Milford, DE		
Polysulphide			
	Permlastic	82032	Base
	Medium Body	81056	Catalyst
	Kerr, Romulus, MI		

half of the perforated acrylic block which had no adhesive produced and the lowest ($p \leq 0.05$) mean peel bond strengths when compared to the other two test surfaces (Table IV).

Discussion

The lowest clinically-acceptable bond strength for a tray adhesive is not known. Also, the force required to remove an impression will vary depending on the number and amount of undercuts present in the mouth. However, when choosing an impression material, it would be prudent to select the material with the greatest bond strength to reduce the possibility of the impression material pulling away from the tray. For the five samples tested, the auto-mix addition reaction silicone material Extrude and its adhesive produced the greatest peel bond strength, surpassing the polysulphide material.

Surprisingly, the polyether Impregum F did not perform well in this study. The lowest peel bond strengths were recorded when using Impregum F and 100 per cent of the failures were adhesive failures. This is in contrast to previous reports^{2,5,6} which indicated that the original Impregum had high tensile and shear bond strengths. In view of this unexpected finding, the experiment was repeated using a different batch number of impression material and adhesive. However, the peel bond strengths obtained were similar to the initial experiment. Therefore, it is suggested that the adhesive for Impregum F may have been reformulated and this new adhesive does not adhere as well to auto-polymerizing tray resin as the original Impregum adhesive.

The significant increase ($p \leq 0.05$) in the peel bond strengths obtained by using a perforated test surface (Table IV) corroborates other studies⁷⁻⁹ which recommend that perforated trays be used when making impressions.

The mean peel bond strength obtained using Reprosil (6.15 kg/cm^2) was greater than the tensile bond strength reported by Pines et al³ (Reprosil 2.90 kg/cm^2) or the peel bond strength reported by Grant and Tjan⁶ (Reprosil 4.7 kg/cm^2). This increased bond strength may be due to the experimental method used in this study or to a change in the formulation of the adhesives. Grant and Tjan also reported that, in general, the addition silicones and polysulphides failed adhesively, whereas the polyether materials failed cohesively. In contrast, the present study found that most of the bond failures for the addition sili-

cones and polysulphide were cohesive failures and that the polyether material failed adhesively (Table III). This observation is supported clinically as it is difficult to peel Extrude out of an acrylic tray immediately after the impression has been removed from the mouth. In contrast, Impregum F, while initially difficult to remove, can usually be pulled away from an acrylic non-perforated tray in one piece.

Conclusions

1. The mean peel bond strengths for the five impression materials tested were

TABLE II

Mean Peel Bond Strengths Using Adhesive Alone or Adhesive and Perforations (kg/cm^2)

Impression Material	Adhesive Only		Adhesive & Perforations	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Extrude	10.88	1.03	15.58	2.85
Permlastic	8.95	0.85	14.40	2.90
Express	7.03	2.08	11.28	1.75
Reprosil	6.15	0.70	11.13	1.75
Impregum F	2.35	0.28	5.93	1.40

number of samples = 10
Solid line indicates materials which were not significantly different at $p \leq 0.05$.

TABLE III

Mode of Adhesive Failure

Material	Non-perforated		Perforated	
	Adhesive	Cohesive	Adhesive	Cohesive
Extrude	2	8	3	7
Express	9	1	9	1
Reprosil	7	3	0	10
Permlastic	1	9	2	8
Impregum F	10	0	10	0

TABLE IV

Effect of Perforations Alone, Adhesive Alone, or Using Perforations and Adhesive on the Mean Peel Bond Strength (kg/cm^2)

Test Surface	Impression Material									
	Extrude		Permlastic		Express		Reprosil		Impregum F	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Perforations Only	3.70	2.35	1.05	0.48	2.55	1.75	1.83	1.15	4.58	1.50
Adhesive Only	10.88	1.03	8.95	0.85	7.03	2.08	6.15	0.70	2.35	0.28
Perforations & Adhesive	15.58	2.85	14.40	2.90	11.28	1.75	11.13	1.75	5.93	1.40

For each impression material all the test surfaces were significantly different at $p \leq 0.05$.

significantly different ($p \leq 0.05$). The greatest peel bond strength (15.58 kg/cm²) was produced using medium-body Extrude and a perforated acrylic surface.

2. For all the impression materials, using an adhesive on a perforated acrylic surface produced significantly greater ($p \leq 0.05$) peel bond strengths compared to either using an adhesive or a perforated acrylic surface alone.
3. To achieve the greatest peel bond strength between the impression material and the acrylic tray, an adhesive should be used and the tray should be perforated. Δ

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References

1. Davis, G.B., Moser, J.B. and Brindsen, G.I. The bonding properties of elastomer tray adhesives. *J Prosthet Dent* 36:278-285, 1976.
2. Nicholson, J.W., Porter, K.H. and Dolan, T. Strength of tray adhesives for elastomeric impression materials. *Oper Dent* 10:12-16, 1985.
3. Pines, M., Penugonda, B., Vaidyanathan, T.K. et al. Adhesive bond strengths of PVS impression material adhesives. *J Dent Res* 65:259, 1986.
4. Ellam, A.H. and Smith, D.C. The relative effectiveness of adhesives for polysulphide impression materials. *Br Dent J* 120:135-138, 1966.
5. Phillips, R.W. *Science of Dental Materials*. Ed. 8. Philadelphia, W.B. Saunders Co., 1982, p. 150.
6. Grant, B.E. and Tjan, A.H.L. Tensile and peel bond strengths of tray adhesives. *J Prosthet Dent* 59:165-168, 1988.
7. Pines, M., Penugonda, B., Vaidyanathan, T.K. et al. Tray perforation effects on the retention of PVS impression material. *J Dent Res* 66:133, 1987.
8. Tjan, A.H.L. and Wang, S.B. Comparing effects of tray treatment on the accuracy of dies. *J Prosthet Dent* 58:175-178, 1987.
9. Bomberg, T.J., Goldfogel, M.H., Hoffman, W. et al. Considerations for adhesion of impression materials to impression trays. *J Prosthet Dent* 60:681-684, 1988.

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JOURNAL

La peur des traitements dentaires chez les jeunes adolescents : Développement et évaluation d'une mesure cognitive

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SOMMAIRE

L'Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s de Morin, et al. est administré à 343 sujets choisis de façon aléatoire. Une analyse factorielle de l'inventaire met à jour la présence d'un facteur général rendant compte de 33,5 pour cent de la variance totale. La consistance interne telle que mesurée par le coefficient alpha est de 0,91. Une mesure de la fidélité test-retest ($N = 181$) pour une période de quatre semaines indique que l'instrument est stable ($r = 0,85$). La valeur de l'erreur-type de mesure du score total est de 4,63. Une table de normes ainsi qu'une description de l'inventaire révisée sont présentées.

ABSTRACT

Morin et al.'s Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s [Adolescents' Fear of Dental Treatment Cognitive Inventory] was administered to 343 subjects. Factor analysis revealed a single general factor that accounted for 33.5 per cent of the total variance. A reliability test revealed an alpha coefficient of 0.91, which was quite acceptable. A measure of test-retest reliability over a four-week period ($N = 181$) indicated that the scale was stable over time ($r = 0.85$). Standard error of measurement was found to be 4.63. Normative data are provided along with a description of the final version of the scale.

Bien que les progrès scientifiques et technologiques dans le domaine de la médecine dentaire aient grandement contribué à réduire l'inconfort ou la douleur qui caractérisait l'administration des traitements dentaires dans le passé, plusieurs enquêtes révèlent toujours que cinq à six pour cent de la population ont une peur des traitements dentaires si intense

qu'ils évitent complètement le dentiste.¹⁻³ D'autres études estiment qu'un autre 10 à 15 pour cent de la population vont se faire soigner par le dentiste mais qu'ils éprouvent toujours une anxiété plus ou moins intense en situation de traitements dentaires.⁴ Il semblerait que les performers anxieux ne soient pas sans susciter de difficultés pour le dentiste puisqu'une enquête auprès de 500 dentistes-cliniciens révèle que 87 pour cent d'entre eux désignaient la peur des traitements dentaires comme étant le problème de gestion le plus fréquemment rencontré dans leur pratique.⁵ Il s'ensuit, comme l'a déjà fait remarquer Klepac en 1986,³ que la compréhension et le traitement de la peur dentaire demeurent des sujets de recherches importants.

Afin d'effectuer les études requises dans le domaine, des instruments de mesures ont été développés. Parmi les plus importants de ces derniers, on distingue le *Dental Anxiety Scale* (DAS) de Corah⁶ et le *Dental Fear Survey* (DFS) de Kleinknecht et al.⁷ Il est à noter que ces questionnaires s'adressent aux personnes âgées de 18 ans et plus. Certains efforts ont été faits pour développer des mesures de la peur des traitements dentaires chez les enfants. Le *Dental Subscale of the Children's Fear Survey Schedule* de Melamed, et al.⁸ en est un exemple. Cependant, ces questionnaires sont formulés pour être administrés à de jeunes enfants, c'est-à-dire à des enfants âgés de quatre à 12 ans. À notre connaissance, il n'existe aucun instrument pour mesurer la peur dentaire chez les adolescents.

C'est dans le but de combler cette lacune que l'*Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s* (ICPTD-A)⁹ a été développé par Morin et al. en 1987. Il s'agit d'un instrument dont les items sont formulés sous forme de pensées ou d'idées qu'une personne pourrait avoir dans une situation dentaire. Le sujet qui complète l'inventaire a comme consigne d'évaluer à partir d'une échelle d'un (« je n'y pense jamais ») à cinq (« j'y pense énormément ») jusqu'à quel point la

situation dentaire suscite chez lui telle pensée ou telle idée. Le score total s'obtient en faisant la somme des scores pour chaque item. Ainsi, un score élevé reflète-t-il une peur intense des traitements dentaires.

Comme le suggère son nom, l'inventaire se caractérise par une emphase sur l'évaluation cognitive de l'anxiété dentaire. Cette emphase prend ses racines dans le fait qu'il existe certaines théories et recherches en psychologie qui suggèrent que la peur est plus souvent influencée, sinon déterminée, par les idées qu'on entretient en rapport avec une situation donnée que par la situation elle-même.¹⁰⁻¹² Il importe sans doute de souligner ici qu'il existe au moins une étude dans laquelle on a tenté d'examiner la relation entre le dialogue interne et l'anxiété dentaire. En effet, en examinant des enfants dans une clinique dentaire, Prins¹³ a trouvé que les sujets qui manifestaient une peur intense des traitements dentaires se caractérisaient de façon spécifique par un dialogue interne négatif, alors que ceux dont la peur était faible ou absente n'avait pas de dialogue interne spécifiquement positif ou négatif.

Les items qui ont servi à la construction de l'inventaire ont été soit puisés dans la littérature existante au sujet de la peur des traitements dentaires, soit formulés en s'inspirant de notre expérience clinique à travailler avec des personnes qui éprouvent des difficultés dans ce domaine. À l'origine, l'inventaire contenait 42 items. Afin d'assurer dans une certaine mesure la validité de contenu de l'inventaire¹⁴ ces items ont été soumis à une évaluation par huit spécialistes en phobie dentaire (quatre en psychologie et quatre en dentisterie) qui avaient à déterminer jusqu'à quel point les items étaient bel et bien congruents avec la définition théorique et pratique de la peur des traitements dentaires. Les évaluations étaient faites à partir d'une échelle en pourcentage où 0 signifiait « pas du tout pertinent » et 100, « très pertinent. » Le niveau d'accord inter-juges était déterminé comme suit : lorsqu'un item recevait une cote moyenne de 80 par les huit juges, il était

retenu; lorsque la cote moyenne était moins de 80, l'item était rejeté. Suite à l'analyse de contenu, 13 items ont été rejetés, ce qui signifie que 29 items ont été retenus.

Le but de cette étude était d'effectuer une évaluation psychométrique du questionnaire de Morin et al.⁹ et, s'il y avait lieu, de faire la révision de ce dernier afin d'en améliorer les qualités psychométriques. Il est à noter que l'étude inclut une analyse factorielle du questionnaire et une table de normes pour l'interprétation des scores bruts.

Méthode

Sujets

Les sujets participant à l'étude ont été choisis de façon aléatoire dans une école polyvalente située sur le territoire du Département de santé communautaire de l'Hôpital Hôtel-Dieu de Lévis. Le choix de l'école s'est fait en raison de la similarité qui existe entre le niveau de scolarité de la population adulte de ce territoire et celle du Québec. En ce qui a trait aux études secondaires, le taux de personnes détenant un diplôme est de 33,5 pour cent pour St-Anselme comparativement à 36,0 pour cent pour le Québec; aux études collégiales, les taux de personnes détenant un certificat sont respectivement de 29,0 pour cent et de 29,0 pour cent pour St-Anselme et pour le Québec; et au niveau universitaire, le taux de diplômés est de 4,5 pour cent pour St-Anselme comparativement à 7 pour cent pour le Québec.¹⁵ Une comparaison entre la population du territoire desservie par le Département de santé communautaire de Lévis et la population de la province de Québec indique aussi qu'il existe une similarité entre les deux populations au niveau du nombre de dents cariées ou obturées. Pour le Département de santé communautaire de Lévis, le nombre de dents cariées ou obturées est en moyenne de 3,99 (*ET* = 2,23) alors que celui-ci est de 3,80 (*ET* = 2,89) pour la province de Québec.¹⁶

À l'école, on a demandé à 390 étudiant(e)s de 12 à 15 ans de compléter l'inventaire. Tous ont accepté de le faire. De ce nombre, 343, soit 181 filles (11 filles de 12 ans, 54 de 13 ans, 57 de 14 et 59 de 15 ans) et 162 garçons (12 garçons de 12 ans, 45 de 13 ans, 59 de 14 et 46 de 15 ans), ont complété correctement le questionnaire qui a été administré en classe durant la période de pause. La permission d'effectuer cette recherche avait été accordée au préalable par le directeur de l'école. Le temps requis par les sujets pour remplir le questionnaire était d'environ 15 minutes.

Résultats et discussion

Fidélité

Les analyses corrélationnelles bisserales item-total (*N* = 343) ont révélé que six items ne corrélaient pas significativement et positivement avec le score total (les valeurs des corrélations en question s'étendaient de -0,45 à 0,07). Ceci signifie que six items devaient être éliminés du questionnaire, ce qui a donné lieu à une version révisée du questionnaire. Cette version est reproduite dans l'Annexe I. La matrice des corrélations item-total pour les 23 items composant l'inventaire se trouve dans le Tableau I.

TABLEAU I

Matrice de corrélations item-total de l'Inventaire cognitif de la peur des traitements dentaires (*N* = 343)

ITEM		ITEM	
1	0.60**	13	0.63**
2	0.50**	14	0.48**
3	0.49**	15	0.50**
4	0.25**	16	0.62**
5	0.55**	17	0.62**
6	0.39**	18	0.69**
7	0.61**	19	0.38**
8	0.57**	20	0.57**
9	0.53**	21	0.61**
10	0.63**	22	0.35**
11	0.41**	23	0.54**
12	0.56**		

***p* < 0.001

Les 23 items de l'inventaire ont été soumis à une analyse de consistance interne à l'aide de la formule 20 de Kuder-Richardson qui a révélé que la valeur du coefficient alpha était de 0,91. Ce niveau de fidélité peut être considéré comme pleinement satisfaisant pour des fins expérimentales.¹⁴

Fidélité test-retest

Les 23 items ont subséquemment été administrés deux fois à un nouvel échantillon de 181 étudiants choisis aléatoirement dans un collège (soit 88 filles et 93 garçons). Un intervalle de quatre semaines séparait les deux administrations. Les coefficients de stabilité ont été évalués pour chaque item ainsi que pour le score total (Tableau II). Le coefficient de corrélation de Pearson pour le score total était de 0,84 (*p* < 0,001). Une estimation de l'erreur-type de mesure du score total a donné comme valeur 4,63.

TABLEAU II

Fidélité test-retest de l'Inventaire cognitif de la peur des traitements dentaires pour une période de 4 semaines (*N* = 181).

ITEM		ITEM	
1	0.60**	13	0.64**
2	0.63**	14	0.66**
3	0.60**	15	0.68**
4	0.31**	16	0.64**
5	0.49**	17	0.67**
6	0.69**	18	0.73**
7	0.61**	19	0.66**
8	0.63**	20	0.61**
9	0.67**	21	0.64**
10	0.55**	22	0.48**
11	0.54**	23	0.64**
12	0.27**		
SCORE TOTAL		0.85**	

***p* < 0.001

Structure factorielle

Une analyse de la structure factorielle du test a été effectuée en soumettant la matrice de corrélations entre les items du questionnaire (Tableau III) à une analyse des composantes principales. Cette analyse a produit quatre facteurs avec une racine latente (eigenvalue) supérieure à l'unité (1,00). Ensemble, ces facteurs expliquaient 50,5 pour cent de la variance totale.

La matrice de saturations avant rotation des axes a permis de mettre en évidence la présence d'un facteur général qui rendait compte au total de 33,5 pour cent de la variance commune à tous les items, ceux-ci ayant tous une saturation positive. Essentiellement, ce facteur reflétait le caractère négatif des pensées qu'avaient les sujets face aux traitements dentaires. Les items qui le définissaient le mieux étaient ceux ayant trait à la peur de se sentir mal face à certains traitements dentaires (nettoyage, restauration et extraction d'une dent), la crainte que le dentiste pose des gestes qui causent de la douleur, et l'évitement de la situation dentaire.

Une rotation orthogonale varimax des axes a ensuite été effectuée dans le but de faciliter l'identification de la nature des composantes principales. Les résultats de cette rotation, qui a pour principal effet d'atténuer le facteur général, sont résumés dans le Tableau IV. Les trois premiers facteurs de ce tableau se caractérisent par le fait qu'il soit possible d'extraire pour chacun d'eux cinq items ou plus ayant un poids factoriel significatif (i.e., < 0,40). Ces trois facteurs rendent compte de 45,7

pour cent de la variance totale et contribuent à 86,4 pour cent de la variance expliquée (commune). Pour le dernier facteur, il y a seulement deux items dont l'apport est significatif. Ceci ne signifie pas que la variance liée à ce facteur est nécessairement négligeable, mais plutôt, que la structure factorielle de l'ICPTD-A⁹ est relativement complexe.

L'identification de la nature des trois facteurs principaux à titre de composantes de la peur dentaire pourrait se faire de la façon suivante par ordre d'importance : (1) la peur de se sentir mal lors de certains traitements dentaires; (2) la perception négative du dentiste; et (3) l'évitement de la situation dentaire.

Normes

Une table de normes est développée à partir des données obtenues. La moyenne et l'écart-type pour l'échantillon total ($N = 343$) sont respectivement 45,76 et 15,78. Comme une analyse des scores en fonction des âges ne révèle aucune différence significative ($F [3,339] = 0,33$) et qu'il en est de même pour l'analyse des scores en fonction des sexes ($F [1,34] = 0,71$), une seule table de normes est présentée. Les scores bruts et leurs conversions en scores-types (Z), en scores T et en rangs centiles sont représentés dans le **Tableau V**. Puisque le rang centile représente la proportion de personnes qui obtiennent un score inférieur à un score donné et que la distribution des scores est

discrète alors que théoriquement on a une échelle continue, il est nécessaire de déterminer la fréquence cumulée au point milieu de l'intervalle (fcpmi) en ajoutant la moitié du nombre de scores de l'intervalle à la fréquence cumulée (fcpmi = fci + 0,5fi) avant de calculer le rang centile. Le rang centile s'obtient en multipliant fcpmi par $1/N$.¹⁷ Un score Z est ensuite attribué à chaque centile à l'aide d'une table représentant la distribution normale des probabilités. Les scores T sont déduits des scores-types en utilisant la formule $T = 50 + 10Z$. La moyenne des données normalisées est de 47,8 et l'écart-type de 15.

Pour conclure, les résultats démontrent que l'ICPTD-A⁹ est un instrument dont les qualités psychométriques (validité de contenu, consistance interne, facteur général, erreur-type de mesure) sont excellentes. Cet instrument fournit non seulement une nouvelle mesure de la peur des traitements dentaires; elle s'adresse aussi à une population pour laquelle aucune mesure de la peur dentaire n'était disponible. D'autres recherches sont maintenant en cours dans notre laboratoire pour étudier sa relation avec une mesure comportementale de la peur des traitements dentaires (validité convergente) et pour vérifier son utilité comme indice de progrès thérapeutiques (validité discriminante). Δ

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Références bibliographiques

1. Crockett, B. Dental Survey: Southern State College, *J Okla State Dent Assoc*, 55:25, 1965.
2. Ingersoll, B.D. *Behavioral Aspects in Dentistry*. East Norwalk, CT, Apple-Century-Crofts, 1982.
3. Klepac, R.K. Fear and avoidance of dental treatment in adults. *Ann Behav Med*, 8:17-22, 1986.
4. Kleinknecht, R.A., *The Anxious Self: Diagnosis and Treatment of Fears and Phobias*. New York, Human Sciences Press, 1986.
5. Ingersoll, B.D., Ingersoll, T.G., McCutcheon, W.K. et al. *Behavioral Dimensions of Dental Practice*. Manuscrit inédit, West Virginia University School of Dentistry, 1979.
6. Corah, N.L. Development of a Dental Anxiety Scale *J Dent Res*, 48:77-78, 1969.
7. Kleinknecht, R.A., Klepac, R.K. et Alexander, L.D. Origins and characteristics of fear of dentistry. *JADA*, 86:842-848, 1973.
8. Melamed, B.G., Yurcherson, R., Fleece, E.L. et al. Effects of film modeling on the reduction of

TABLEAU III

Matrice de corrélations de Pearson entre les items de l'Inventaire cognitif de la peur des traitements dentaires ($N = 343$)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		.37**	.38**	.10	.35**	.37**	.37**	.35**	.30**	.35**	.24**	.39**	.37**	.29**	.29**	.35**	.41**	.47**	.21**	.37**	.36**	.22**	.33**
2			.30**	.03	.33**	.44**	.26**	.31**	.31**	.37**	.05	.30**	.34**	.16**	.29**	.32**	.34**	.41**	.24**	.36**	.21**	.08	.29**
3				.13*	.26**	.48**	.35**	.28**	.19**	.37**	.21**	.28**	.30**	.28**	.24**	.33**	.37**	.45**	.10	.25**	.38**	.19**	.28**
4					.08	.11	.26**	.08	.22**	.17**	.38**	.11	.14*	.22**	.08	.22**	.14*	.15*	.03	.11	.29**	.22**	.15*
5						.20**	.32**	.17**	.26**	.22**	.09	.15*	.20**	.28**	.16*	.21**	.28**	.31**	.12	.11	.37**	.33**	.33**
6							.25**	.28**	.26**	.30**	.20**	.25**	.35**	.20**	.22**	.23**	.29**	.43**	.24**	.32**	.28**	.08	.22**
7								.31**	.31**	.48**	.32**	.34**	.39**	.43**	.34**	.46**	.38**	.40**	.27**	.30**	.35**	.31**	.37**
8									.33**	.36**	.17**	.37**	.35**	.29**	.38**	.40**	.39**	.47**	.22**	.31**	.34**	.10	.23**
9										.36**	.26**	.30**	.30**	.28**	.29**	.37**	.32**	.29**	.38**	.29**	.26**	.14*	.26**
10											.09	.43**	.39**	.45**	.28**	.45**	.46**	.45**	.19**	.37**	.37**	.09	.34**
11												.39**	.47**	.27*	.30**	.41**	.35**	.41**	.11	.40**	.29**	.07	.24**
12													.38**	.26**	.28**	.34**	.42**	.47**	.22**	.39**	.31**	.01	.34**
13														.37**	.33**	.38**	.43**	.48**	.23**	.51**	.33**	.11	.35**
14															.28**	.49**	.40**	.42**	.11	.31**	.31**	.04	.29**
15																.35**	.36**	.28**	.15*	.38**	.31**	.08	.23**
16																	.47**	.48**	.31**	.43**	.42**	.01	.36**
17																		.45**	.23**	.36**	.35**	.12	.45**
18																			.29**	.41**	.46**	.29**	.35**
19																				.34**	.01	.17**	.17*
20																					.22**	.18**	.28**
21																						.25**	.37**
22																							.28**
23																							

** $p < 0.001$ * $p < 0.01$

anxiety-related behaviors in individuals varying in level of previous experience in the stress situation. *J Consult Clinical Psychol*, 46:1357-1367, 1978.

9. Morin, B., Gauthier, J., Ricard S. et al. *L'inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s*. Manuscrit inédit. Université Laval, École de psychologie, Laboratoire de médecine comportementale, Québec, 1987.

10. Beck, A.T. et Emery, G. *Anxiety Disorder and Phobias: A Cognitive Perspective*. New York, Basic, 1985.

11. Marshall, W.L., Gauthier, J., et Gordon, A. Current status of flooding therapy. In *Progress in Behavior Modification* Vol. 4, Hersen, M., Eiseler, R.M. et Miller, P.M. ed. New York, Academic Press, p. 205-275, 1979.

12. Williams, S.L. On the nature and measurement of agoraphobia. In *Progress in Behavior Modification* Vol. 19, Hersen, M., Eisler, R.M. et Miller, P.M. ed. New York, Academic Press, p. 109-144, 1985.

13. Prins, P.J.M. Self-speech and self-regulation of high- and low-anxious children in the dental situation: an interview study. *Behav Res Ther*, 23:641-650, 1985.

14. Nunnally, J.C., *Psychometric Theory*, ed. 2. New York, McGraw Hill, Inc., 1978.

15. Statistique Canada *Catalogue de Statistique Canada du Recensement 1981* (Catalogue 93-941). Ottawa, Statistique Canada, 1981.

16. Payette M. et Plante, R. *Enquête santé dentaire Québec 1983-1984 Région 03*. Québec, Ministère de la santé et des services sociaux, Association des hôpitaux du Québec Division CH-DSC. Rapport complémentaire Janvier 1987.

17. Bernier, J.J. *Théories des testes : Principes et techniques de base* Québec, Gaétan Morin, 1984.

TABLEAU IV

Matrice des saturations et communautés après rotation orthogonale des axes (varimax) (N = 343)

ITEM	FACTEURS				h ²
	I	II	III	IV	
1	0.409	0.183	0.486	0.125	0.453
2	0.368	0.148	0.554	0.300	0.554
3	0.245	0.240	0.707	-0.139	0.637
4	0.006	0.678	0.002	0.037	0.461
5	0.697	-0.049	0.171	-0.010	0.518
6	0.121	0.058	0.802	0.190	0.697
7	0.446	0.469	0.162	0.158	0.470
8	0.602	0.048	0.202	0.147	0.427
9	0.295	0.244	0.112	0.627	0.552
10	0.560	0.276	0.255	0.079	0.461
11	0.100	0.745	0.202	0.092	0.614
12	0.583	0.117	0.211	0.125	0.414
13	0.613	0.121	0.267	0.132	0.479
14	0.547	0.432	0.029	-0.081	0.493
15	0.576	0.103	0.057	0.135	0.364
16	0.626	0.338	0.072	0.216	0.558
17	0.579	0.288	0.243	0.080	0.484
18	0.511	0.264	0.488	0.108	0.581
19	0.127	0.085	0.103	0.847	0.751
20	0.587	0.033	0.195	0.332	0.494
21	0.346	0.463	0.312	0.088	0.439
22	0.210	0.572	0.030	0.080	0.379
23	0.332	0.450	0.253	0.110	0.389
Sommes des carrés	4,805	2,736	2,534	1,593	11,668
% de la variance totale	33.5	7.2	5.0	4.8	50.5
% de la variance expliquée	41.2	23.5	21.7	13.7	100.0

TABLEAU V

Table des normes de l'Inventaire cognitif de la peur des traitements dentaires pour adolescents (N = 343)

Score brut	Score T	Centile	Score z	Score brut	Score T	Centile	Score z	Score brut	Score T	Centile	Score z
23	13.0	1	-3.00	51	53.2	62	0.32	79	69.9	98	1.99
24	22.4	1	-2.76	52	53.8	65	0.38	80	69.9	98	1.99
25	25.6	1	-2.44	53	54.1	66	0.41	81	69.9	98	1.99
26	28.2	1	-2.18	54	54.6	66	0.46	82	69.9	98	1.99
27	31.5	3	-1.85	55	55.0	68	0.50	83	69.9	98	1.99
28	34.7	6	-1.53	56	55.5	69	0.55	84	70.2	98	2.02
29	39.9	9	-1.31	57	56.1	71	0.61	85	70.5	98	2.05
30	37.9	11	-1.21	58	56.4	73	0.64	86	70.5	98	2.05
31	39.0	14	-1.10	59	57.0	75	0.70	87	70.8	98	2.08
32	40.2	16	-0.98	60	57.6	76	0.76	88	71.8	99	2.18
33	41.0	19	-0.90	61	58.2	78	0.82	89	72.7	99	2.27
34	41.9	21	-0.81	62	58.7	79	0.87	90	72.7	99	2.27
35	42.8	23	-0.72	63	59.5	81	0.95	91	73.2	99	2.32
36	43.5	26	-0.65	64	50.0	83	1.00	92	73.8	99	2.38
37	44.1	28	-0.59	65	50.0	84	1.07	93	73.8	99	2.38
38	44.7	30	-0.53	66	50.0	86	1.14	94	73.8	99	2.38
39	45.3	32	-0.47	67	50.0	87	1.22	95	73.8	99	2.38
40	45.8	34	-0.42	68	50.0	89	1.32	96	74.4	99	2.44
41	46.6	37	-0.34	69	50.0	91	1.40	97	75.2	99	2.52
42	47.6	41	-0.24	70	50.0	92	1.48	98	75.2	99	2.52
43	48.4	44	-0.16	71	50.0	93	1.54	99	75.2	99	2.52
44	49.1	46	-0.09	72	50.0	94	1.61	100	76.2	99	2.62
45	49.5	48	-0.05	73	50.0	95	1.68	101	77.6	100	2.76
46	49.9	50	-0.01	74	50.0	95	1.71	102	77.6	100	2.76
47	50.4	52	0.04	75	50.0	96	1.76	103	79.6	100	2.96
48	50.9	53	0.09	76	68.5	96	1.85	104-115	80.0	100	3.00
49	51.4	56	0.14	77	69.2	97	1.92				
50	52.1	58	0.21	78	69.6	97	1.96				

Annexe I

Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s

par Brian Morin, Janel Gauthier, Suzanne Ricard et Laurent Dufour
Université Laval

CECI EST UN QUESTIONNAIRE QUI CONCERNE LES TRAITEMENTS DENTAIRES ET LES VISITES CHEZ LE DENTISTE.

TU DOIS INDiquer À L'AIDE DE L'ÉCHELLE QUI SUIT À QUEL POINT LES PHRASES QUI SUIVENT CORRESPONDENT À TES PROPRES IDÉES OU PENSÉES EN ENCERCLANT LE CHIFFRE APPROPRIÉ :

PAS DU TOUT	UN PEU	MOYENNEMENT	BEAUCOUP	ÉNORMÉMENT
1	2	3	4	5

EXEMPLE :

Les études sont importantes dans la vie 1 2 3 4 5

UN CERCLE AUTOUR DU CHIFFRE « 4 » INDIQUERAIT QUE CETTE PHRASE CORRESPOND « BEAUCOUP » À CE QUE TU PENSES DES ÉTUDES OU ENCORE QUE CETTE IDÉE TE VIENT « BEAUCOUP » À L'ESPRIT EN PENSANT AUX ÉTUDES.

NOTES BIEN : IL N'Y A PAS DE BONNES OU DE MAUVAISES RÉPONSES.

L'IMPORTANT, C'EST D'INDIQUER CE QUE TU PENSES.

1. Si on me parle d'aller chez le dentiste, je pense à des excuses pour ne pas y aller	1	2	3	4	5
2. Je me sentirais beaucoup moins nerveux(se) en quittant la clinique dentaire qu'en arrivant . . .	1	2	3	4	5
3. J'irais chez le dentiste uniquement si je n'avais pas le choix	1	2	3	4	5
4. Le dentiste est aimable et va s'efforcer de ne pas me faire mal	1	2	3	4	5
5. Je n'aime pas me faire arracher une dent parce que j'ai peur de me sentir mal	1	2	3	4	5
6. Je n'aime pas aller chez le dentiste	1	2	3	4	5
7. Si le dentiste travaillait dans ma bouche, j'aurais toujours peur de m'étouffer	1	2	3	4	5
8. Si j'étais sur la chaise du dentiste, je fermerais les yeux pour ne pas voir la seringue et les autres instruments du dentiste	1	2	3	4	5
9. Moi, ce sont les « sons » qu'on entend chez le dentiste que je n'aime pas	1	2	3	4	5
10. Si le dentiste travaillait dans ma bouche, je pense que je me mettrais à trembler	1	2	3	4	5
11. Le dentiste n'est pas aimable	1	2	3	4	5
12. Si j'étais dans la salle d'attente du dentiste, j'aurais peur que l'on voit que je suis très nerveux(se)	1	2	3	4	5
13. Je n'aime pas me faire « plomber » une dent parce que j'ai peur de me sentir mal	1	2	3	4	5
14. Je n'aime pas me faire nettoyer les dents chez le dentiste parce que j'ai peur de me sentir mal	1	2	3	4	5
15. Si le dentiste travaillait dans ma bouche, je pense que j'aurais du mal à toujours garder la bouche ouverte	1	2	3	4	5
16. Chez le dentiste, j'aurais peur d'avoir mal au coeur	1	2	3	4	5
17. Une fois sur la chaise du dentiste, je serais tellement nerveux(se) que je ne pourrais même pas répondre aux questions qu'il me pose	1	2	3	4	5
18. Si quelqu'un venait me dire que je dois aller chez le dentiste demain matin, je me sentirais mal	1	2	3	4	5
19. Moi, ce sont les odeurs chez le dentiste que je n'aime pas	1	2	3	4	5
20. Je n'aime pas me faire « geler » la gencive parce que j'ai peur de me sentir mal	1	2	3	4	5
21. Le dentiste nous fait toujours mal	1	2	3	4	5
22. Cela ne donne rien d'aller chez le dentiste	1	2	3	4	5
23. Si j'avais un mal de dent, j'aimerais mieux attendre qu'il passe au lieu d'en parler et d'aller chez le dentiste	1	2	3	4	5

Note : Lors de l'administration de l'inventaire, les chiffres et les termes définissant l'échelle présentée dans les consignes doivent apparaître en haut de chacune des pages qui suivent la page sur laquelle se trouvent les consignes.

Skin exposure and thyroid dose distribution using niobium filtration

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Toronto

ABSTRACT

A thermoluminescent dosimetry system was utilized to investigate how much the radiation dose is reduced through the addition of a niobium-based accessory filter to an X-ray unit's conventional aluminum filter. A two-bitewing series was exposed in a tissue-equivalent human phantom. The skin exposures from an X-ray beam with the added niobium filter and a beam with the aluminum filter alone were measured and compared. Thyroid dose distribution was also measured and similarly compared. Utilization of the niobium filter resulted in a significant reduction in skin exposure ($p < 0.001$) of 14.8 per cent. Thyroid dose was not lessened by using the niobium filter, however. In fact, in one region of the thyroid it increased significantly.

SOMMAIRE

On a utilisé un dosimètre à thermoluminescence pour étudier la réduction du rayonnement lorsqu'on ajoute un filtre à base de niobium au filtre d'aluminium ordinaire. On a exposé une série de bitewings doubles dans un fantôme munis de tissus ressemblant à ceux des humains. On a mesuré et comparé les taux d'exposition aux rayons X avec le filtre au niobium ainsi qu'avec le seul filtre d'aluminium. On a également mesuré et comparé la distribution de la dose atteignant la thyroïde. Avec le filtre au niobium, on a relevé une réduction importante de 14,8 pour cent dans le taux d'exposition ($p < 0,001$). Pour la thyroïde cependant, le filtre au niobium n'a pas réduit la dose de rayonnement qui, de fait, a été plus forte pour une partie de la glande.

Introduction

Recently, there has been considerable interest in reducing patient exposure to ionizing radiation from diagnostic radiography. Although it is not clear what the magnitude of risk from low-level diagnostic radiation is, the ALARA principle, which states that radiation dose should be as low as reasonably achievable,¹ is

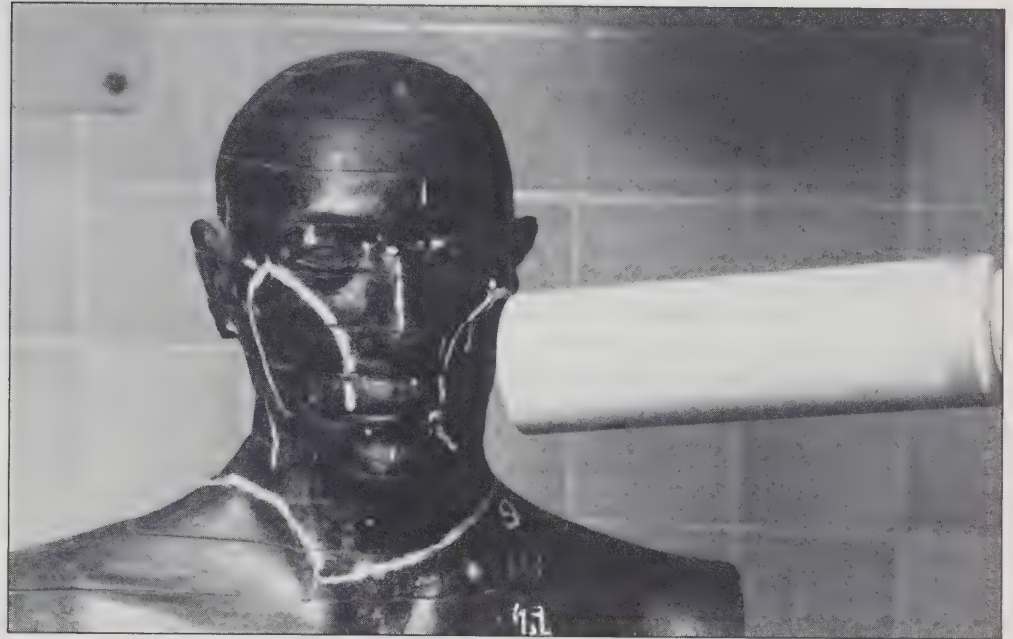


Fig. 1: Setup used for irradiation of the phantom. Dosimeters for the thyroid gland were placed within the neck at levels 9, 10, and 11. Skin exposure dosimeters are located within the primary beam on the skin surface.

generally accepted. Improvement in film speed,² beam collimation,^{3,4} and the use of thyroid shielding^{5,6} have all resulted in decreased patient dose. Alterations in the quality of the X-ray beam through the use of various filtration methods have also reduced patient exposure from intraoral radiography.⁷⁻⁹

Although many studies have included an analysis of skin exposure from intraoral radiography, there appears to be little information on thyroid gland dose. The thyroid gland is often within the field of either direct exposure or scatter exposure during many conventional dental radiographic procedures. Furthermore, the organ is known to be radio sensitive to relatively low doses of radiation and has been identified to be at risk for the development of malignancy.¹⁰

In 1988, a new filtration device composed of niobium, released under the trade name Niobi-X (RAD/RED Laboratories Inc., Toronto, Ontario), was introduced into the dental market. The manufacturer claimed a 30 to 60 per cent reduction in radiation levels and an approximate 40 per cent reduction in skin exposure. The purpose of this paper is to investigate the truth of these claims.

Materials and Methods

During all phases of this experiment, exposures were made with a General Electric, dental X-ray generator (model 11C38A1ST) [Gendex Corporation, Milwaukee, Wis.]. Exposures were made by adding the Niobi-X filter to the aluminum filter (niobium filtration) or with the aluminum filter alone (conventional filtration). Bitewing exposure factors for D-speed type radiographic film of 70 kVp, 10 milliamperes and 48 impulses were used. In order to compare the dose to the skin and to the thyroid gland from the conventional and the niobium filtered beam, it was necessary to equalize the densities of the resultant dental radiographic films. Therefore, adjustments to the X-ray exposure factors were made in order to compensate for the decrease in the intensity of the X-ray beam and accompanying loss in film density with the addition of the Niobi-X filter. This was accomplished by increasing the time of exposure from the normal exposure (time) used for posterior bitewing radiograph films with this generator. An identical film density of 1.0 for a mid density was determined by exposing an aluminum step wedge. This optical density was measured

using a Macbeth densitometer [TD504 Kollmorgen Ltd., Newburg, N.Y.]. All films were developed manually following the manufacturer's specifications with fresh chemistry.

The dosimetry technique utilized was previously described by Wood et al in 1989.⁶ Thermoluminescent materials were used in this investigation. These devices, when irradiated, trap the energy within their crystal structure. Upon heating, following radiation dosage, they give off light. The amount of light emitted is directly proportional to the amount of radiation energy received. A tissue equivalent Rando "average man" model 1152 male human phantom [Rando-Alderson, Hartford, Conn.], was utilized throughout this experiment (Fig. 1). The dosimetry system consisted of soft-tissue equivalent LiF rods of one millimetre in diameter and six millimetres in length [TLD 100, Harshaw Chemical Company Solon, Ohio]. Dosimeter light output was measured using a Harshaw model 3000 TLD reader. The methodology has been previously described.⁶

The dosimeters were placed on the skin or within the thyroid region of the phantom. Bilateral single bitewing radiographs were used in this evaluation as they represent the most common intraoral radiographs exposed. A film was placed within the phantom corresponding to the precise location necessary for exposing a bitewing radiograph of the posterior teeth. The collimator was aligned to yield a plus 10 degree angulation of the tube head relative to the occlusal plane. The dosimeters used for skin exposure measurements were placed immediately on the skin surface within the primary beam. A series of five exposures were made to a total of six dosimeter crystals and the dosimeters were read out. The dose they received was then determined from their light output, and a mean and standard deviation of dose per exposure was calculated. Following this procedure, the experiment was repeated, except the niobium filter was added to the generator in the manner suggested by the manufacturer. A new set of six TLD-100 crystals were placed in an identical manner to the first set, and these were dosed according to the exposure factors determined from the densitometer data. The mean dose received by the crystals was compared with the conventional X-ray beam and the niobium-added beam, using a Students t-test.

The entire experiment was repeated twice to determine the difference in thyroid dosage between the two techniques. Crystals were placed in seven locations, at three levels within the thyroid gland. Four hun-

TABLE I

Radiation absorbed dose in μGy for each thyroid site

Thyroid region	Conventional filtration			Added Niobi-X filtration		
	Mean light output (nC)	S.D.	$\mu\text{Gy}/\text{film}$	Mean light output (nC)	S.D.	$\mu\text{Gy}/\text{film}$
9 right	1.18	0.37	1.22	1.17	0.41	1.21
9 middle	1.37	0.39	1.40	1.21	0.32	1.24
10 right	0.34	0.14	0.45	0.49	0.11	0.59
10 middle	0.41	0.08	0.52	0.50	0.20	0.59
10 left	0.42	0.21	0.52	0.55	0.12	0.64
11 right	0.11	0.07	0.23	0.17	0.09	0.29
11 left	0.16	0.06	0.28	0.22	0.11	0.34

Numbers 9, 10 and 11 correspond to anatomic level within the human phantom. Level 9 is the most superior level, level 11 the inferior-most. "Right" or "left" refer to location within the phantom anatomically.

dred bitewing radiographs for each method of filtration were exposed in a manner so as not to exceed the duty cycle of the X-ray generator. These crystals were then recovered and read out for each site. Six crystals were analyzed for each thyroid site under each filtration method. The dose per film was calculated and comparisons between the conventional and niobium filtration techniques using a Students t-test were performed.

Results

For skin exposure with conventional filtration, the mean light output was 1.87 nC (standard deviation 0.34). The dose per film was calculated to be 148 μGy . When niobium/aluminum filtration was used, the mean light output was 1.58 nC (standard deviation of 0.22). The dose per film was 126.48 μGy , a 14.8 per cent reduction. The Students t-test showed the difference in dose per film to be statistically significant at $p < 0.001$.

Table I summarizes the results obtained for the thyroid dose measurements and indicates the doses to each position with and without the Niobi-X filter added. The Students t-test indicates no significant difference in dose at all positions except at level 10 in the right lobe of the thyroid. The dose measured using niobium/aluminum filtration was significantly higher ($p < 0.05$) than the dose using the aluminum filtration alone.

Discussion

In this study, the addition of the Niobi-X filter did not reduce the thyroid dose. In fact, in one region of the gland, the dose was significantly higher when compared to

aluminum filtration alone. This could be a chance occurrence or it could be due to small misalignments in beam-film dosimeter alignment. However, the Niobi-X filter did significantly decrease exposure to skin by 14.8 per cent (not the claimed 40 per cent).

The k-edge of niobium is 19 keV. Its absorption of radiation energy below this level gradually increases from zero to just above the k-edge absorption, where it is nearly 100 per cent. After this point, absorption quickly decreases with increasing energy. Therefore, the addition of a niobium filter will increase the mean energy of the beam and would likely be responsible for a reduction in skin entrance dose (primary beam) by decreasing the number of low-energy photons. However, there was no significant effect on the dose to the majority of the thyroid gland region. Since thyroid exposure from the bitewing view is mainly from scatter radiation,⁶ it seems reasonable to suggest that the increased dose to the thyroid is the result of increased exposure from scatter radiation. This is supported by the fact that higher-energy X-ray photons are more likely to undergo scattering.⁶

Since the thyroid gland is more sensitive to low levels of ionizing radiation than skin,¹⁰ it is important to include accurate thyroid dosimetry when assessing X-ray beam filters. Ponce et al⁹ and Richards et al⁷ made entrance dose measurements using erbium and samarium filtration, respectively, and both demonstrated dose reduction. Tyndall⁸ has shown that rare earth filtration ($\text{Gd}_2\text{O}_2\text{S:Tb}$ (gadolinium oxysulfide)) in panoramic radiography has different effects on skin and thyroid dose. Data from that study indicated a 50 per cent dose reduction to skin, compared to

a 27 per cent dose reduction to thyroid with rare earth material filtration.

This investigation makes clear the need for thyroid dose measurement, since the results show not only that the niobium filter had different effects on skin and thyroid dose, but also that a reduction in skin dose does not necessarily indicate an associated reduction in thyroid dose. It is possible that use of the Niobi-X filter may result in an increased dose to the thyroid, since five of the seven thyroid regions where measurements were made showed higher doses with the added niobium filter than with aluminum alone.

The manufacturer's claim of a 40 per cent reduction of radiation to the patient was not supported by the present study, where skin exposure was lessened by 14.8 per cent. Internal scatter to critical organs remains a problem with filtered X-ray beams. Further studies using added aluminum filtration, or filters which alter the X-ray beam spectrum by absorbing high energy photons, seem to be indicated. Δ

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References

1. Poyton, H.G. *Oral Radiology*. Baltimore, Williams and Wilkins, 1982, pp. 17, 20.
2. Silha, R.E. The new Kodak Ekta-speed dental X-ray film. *Dent Radiogr Photogr* 54:32-36, 1981.
3. Winkler, K.G. Influence of rectangular collimation and intraoral shielding on radiation dose in dental radiography. *JADA* 77:95-101, 1968.
4. Stenstrom, B., Henrikson, C.O., Holm, B. et al. Absorbed doses from intraoral radiography with special emphasis on collimator dimensions. *Swed Dent J* 10:59-71, 1986.
5. Sikorski, P.A. and Taylor, K.W. The effectiveness of the thyroid shield in dental radiology. *Oral Surg Oral Med Oral Pathol* 58:225-236, 1984.
6. Wood, R.E., Bristow, R.G., Clark, G.M. et al. Technique-dependent decrease in thyroid absorbed dose for dental radiography. *Health Physics* 56:893-901, 1989.
7. Richards, A.G., Barbar, G.L., Bader, J.D. et al. Samarium filters for dental radiography. *Oral Surg* 29:704-715, 1970.
8. Tyndall, D.A. Spectroscopic analysis and dosimetry of diagnostic x-ray beams filtered by rare earth materials. *Oral Surg Oral Med Oral Pathol* 62:205-211, 1986.
9. Ponce, A.Z., McDavid, W.D., Langland, O.E. et al. The use of added erbium filtration in intraoral radiography. *Oral Surg Oral Med Oral Pathol* 66:513-517, 1988.
10. Silverman, C. Thyroid tumors associated with radiation exposure. *Publ Health Rep* 99:369-373, 1984.



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September 12-15: International Association for Orthodontics. Contact: Joanna Carey, 211 E Chicago Ave, Suite 915, Chicago, IL 60611, USA. (312) 642-2602.

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(6-7/8)

ALBERTA: Very busy, rural practice for sale. Established 12 years. Excellent location. Three operatories full-equipped. Reasonably priced at three months gross. Associateship also a possibility. Reply in confidence at (403) 523-5524 after 5 pm.

(5-14/8)

ALBERTA: PRACTICE FOR SALE. Illness forces sale of this prime location practice 1 1/4 hours from Edmonton. Very high gross and low overhead. Offered at one year's net earnings. Financing or associate with option to purchase possible. Phone (403) 542-3756.

(8-8/1)

ALBERTA—Calgary: Must sell due to sudden health problems. Well-established 30-year-old general practice located in the professional building at Chinook Centre. This new six-month-old office features two operatories with room for expansion if desired. Owner forced to retire. (403) 253-0041.

(7-12/7)

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(6-2/11)

ALBERTA—St. Paul: Practice available immediately. Exceptional opportunity — 90 per cent insurance. Priced to sell with reasonable terms. Very good location in excellent trading area. For details, contact (403) 657-3456 days or (403) 657-3409 evenings.

(8-5/8)

SASKATCHEWAN: Large rural practice for sale in progressive community. Modern three op layout with panorex, fully-staffed including therapist and hygienist. High yearly gross. Reduced price as owner is returning to grad school. Please reply to CDA Box 2483.

(3-21/13)

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(7-10/8)

ONTARIO: Well-established family practice for sale in eastern Toronto suburb. Four operatories. Experienced support staff. Owner prepared to stay on one or two days per week for reasonable time to aid transition. Please reply to CDA Box 2518.

(7-2/8)

NEW BRUNSWICK—Moncton: Practice for Sale. Dentist returning to specialize. Modern clinic located in shopping centre. Attractive terms and conditions. Please call (506) 859-0020 or 854-0236 and ask for Stella.

(6-9/8)

Associateships Available

BRITISH COLUMBIA—Vancouver East: WANTED A full-time associate immediately. Option to buy. Long-established, busy, central practice. Please call (604) 876-0712 days.

(8-2/9)

ALBERTA—Edmonton: Associate with view to purchase required in my very busy, well-established general practice. Large recall and referral base. Seven operatories with in-office lab and panorex. Reply to fax (403) 436-4322 or PO Box 4132, Edmonton, AB T6E 4T2.

(6-5/8)

ALBERTA—Grande Prairie: Associate required immediately for busy practice. Opportunity for future partnership. Four fully-equipped ops expanding to six in September. Conditions negotiable. Call (403) 538-4050 (O) or (403) 539-3079 (H).

(8-1/1)

SASKATCHEWAN: Associate wanted for locum in rural practice. Family practice with new equipment and pleasant staff. Terms are negotiable. Please reply to CDA Box 2522.

(8-10/13)

NEW BRUNSWICK: Full-time associate required immediately for busy, well-established (10 years +) practice in semi-urban area of eastern New Brunswick. Enjoy an ample supply of patients in an under-served area. Solid booking two months in advance! C'mon down — we need you! For further details, write CDA Box 2519.

(7-5/9)

NEW BRUNSWICK—Moncton: Associate required immediately for progressive, preventive practice. Excellent working conditions. Mall location. Buy-in negotiable after trial period. Available immediately. Please call (506) 859-0020 or 854-0236 and ask for Stella.

(6-8/8)

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(7-13/8)

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(8-4/9)

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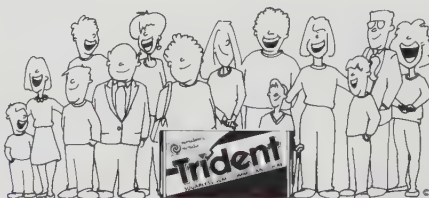
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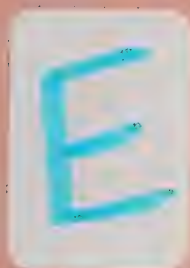


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Vol. 37
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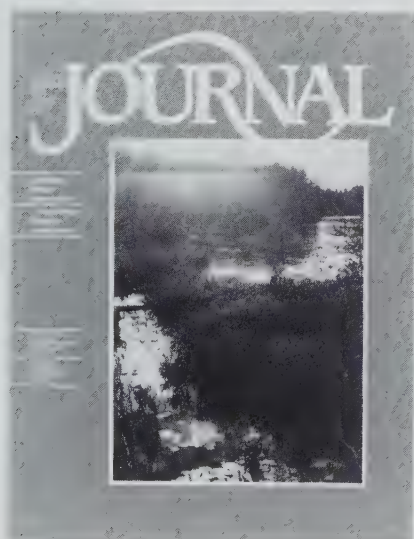
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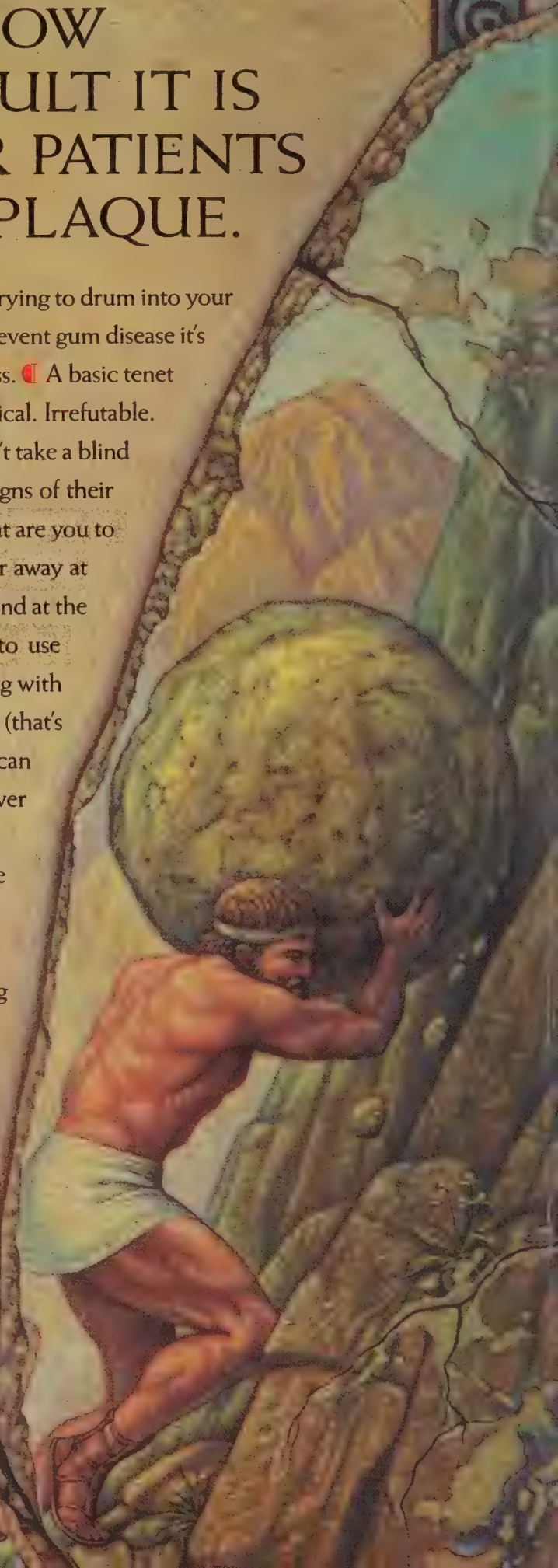
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REFERENCES 1. Lamster JB et al CLIN PREV DENT. 5:12-16, 1983 2. Gordon JM et al J. CLIN PERIODONTOL. 12:697-704, 1985 3. DePaola LG et al J DENT RES. 16:311-315, 1989 4. Overholser D et al J CLIN PERIODONTOL. 17:575-579, 1990 5. Council on Dental Therapeutics Accepts Listerine J AMER DENT ASSOC. 117:515-516, 1988.



IS DENTISTRY PROGRAMMED TO SELF-DESTRUCT?

With a prevention factor in excess of 90 per cent, dentistry appears to be the only profession in the world programmed to self-destruct. A quick review of the other professions bears some evidence that we may be the sole possessor of the self-destruction hypothesis.

In fact, no profession has come as close to meeting its stated objectives as dentistry. Step by step, over a period of years, the process of prevention has been well established. From Pierre Fauchard's work in the 18th century, to the founding of the world's first dental college in Baltimore in 1840. From Willoughby Miller's micro-organism theory in 1890 to Frederick McKay's fluoride investigations in the early 1900s. And on to the present day, hundreds — even thousands — of the world's most notable dental scientists have added probability to the theory that dentistry has programmed itself for self-destruction.

Medicine, despite its many miraculous advances, still has no cure for diseases such as cancer, diabetes, Parkinsons, Alzheimers, Hodgkins, AIDS, and a host of others. Chiropractors need not worry, either. Evolution still hasn't fully adjusted the human spine to stand erect. And optometrists seem to have no particular concern — there is no practical, affordable solution for astigmatism, although a number of exciting advances have been made in laser technology.

Accountants, too, are assured of a productive career for as long as governments decree new tax legislation. And unless future construction designs equal the brilliance of the pyramids, architects should have no fear. Lawyers, of course, will never have to worry. To date society has no cure for human avarice. (We won't even discuss the prospects of the world's oldest profession.)

Nevertheless, McGill University's sudden and unexpected announcement that it will close its faculty of dentistry in 1995 (see story, page 681) came as a shock. Through this action, the univer-



Dr. P. Ralph Crawford

sity has given new credence to the self-destruction theory. We believe the McGill decision makers are unwise. Their judgement indicates short-term gain expediency, which is naive when the future oral health care of Canadians is taken into consideration.

We hasten to remind the governing body at McGill, the politicians and the public that the elimination of dental disease is still only a probability. Much remains to be

accomplished before one of Canada's oldest and most distinguished dental faculties should be allowed to close. Dental disease is still a reality and is as much in evidence in the province of Quebec as it is anywhere else in Canada.

True, there has been a decline in dental caries throughout the entire western world but the operative word is decline. Organized dentistry has recognized this fact and reacted responsibly. The Canadian Dental Association was instrumental in encouraging the Canadian faculties to decrease enrolment. Closure was never a consideration.

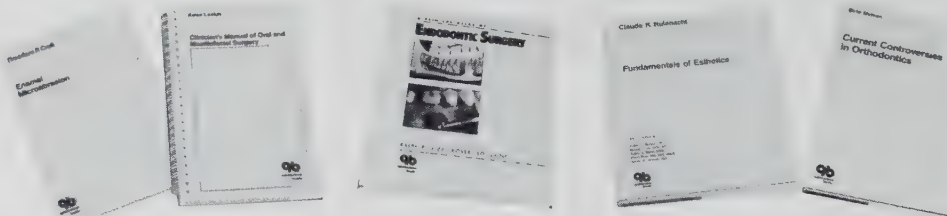
When only 50 per cent of society attends a dentist on a regular basis, our job is incomplete. When less than 30 per cent of the public floss regularly, can we see the end of dentistry? The answer is no. Periodontal disease continues to afflict 90 per cent of society at some period in their lives. And what of the elderly, the disadvantaged, the handicapped? Their societal plight exacerbates their dental problems.

Before a definite decision is made to close McGill's dental faculty we urge thorough reconsideration. Yes, the potential for eradicating dental disease exists. *If* patients were 100 per cent dedicated to prevention. And yes, the self-destruction of a profession is a theory that is remotely probable. But *now* is not the time. Nor will that time occur in the foreseeable future.

P. Ralph Crawford, BA, DMD

Editor: *Journal of the Canadian Dental Association*

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Covers basics of equipment selection, application techniques, clinical restorative and advanced procedures, and problem solving.
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McGill Faculty of Dentistry to Close



McGill University, Strathmore Medical Building

The faculty of dentistry at McGill was in a state of shock July 17, when the university announced that it would close the dental school in the spring of 1995.

In a press release, Dean Ralph Barolet said, "The faculty has a past record of high achievement in graduating excellent dentists to meet the needs of the community, and has managed to do so with the smallest operating budget of any dental school. Despite these facts, McGill University is recommending the closure on financial grounds to effect savings that will be used as partial repayment of its accumulated deficit."

McGill's decision follows a series of internal and external reviews that examined all aspects of the university's operations with the objective of balancing its budget and resolving a deficit of \$77 million. The principal of McGill, David Johnston, explained that the university is pledging itself to concentrate its resources in areas where it is internationally competitive, and where it can ensure that its graduate training and research programs receive the infrastructure support necessary to sustain them.

"It is simply beyond our means to provide the faculty of dentistry with this type of infrastructure," said Johnston.

Dean Barolet expressed concern that the closure of the faculty would directly affect the English-speaking and ethnic communities which McGill serves in Montreal and Quebec. English-speaking students in Quebec who were unable to study dentistry at the French-language faculties at the University of Montreal or Laval would be required to go to the United States — often at a cost of \$25,000 U.S. per year — to become dentists. Dean Barolet said that neighboring schools in Ontario or Nova Scotia rarely accept out-of-province students.

Another concern is the potential loss of dental services at the Montreal General

Hospital. McGill's faculty of dentistry now meets the oral health needs at the hospital, providing care to about 5,000 people. These services, provided at a minimum cost to patients, are often used by needy people. The free dental services offered during the summer months to a large group of physically and/or mentally handicapped children would also be lost.

Observers have commented that these are uneasy times for dental schools. Usually their operating costs per student are the most expensive of any program within a university, and they are easy targets for large scale cuts. Five dental schools have closed or are in the process of closing in United States. And two dental faculties in Canada, Saskatchewan and Alberta, have recently undergone severe examination.

The faculty of dentistry in Alberta has already seen support for its oral biology department cut by 50 per cent, and each year two per cent of the faculty budget is "recovered" by the university. In addition, the faculty must pay back an \$82,000 "tax" to the university from its clinical income.

An encouraging note from Alberta is a government grant that has enabled the faculty of dentistry to increase its dental hygienist enrolment from 40 to 50 this fall and to 65 in 1992.

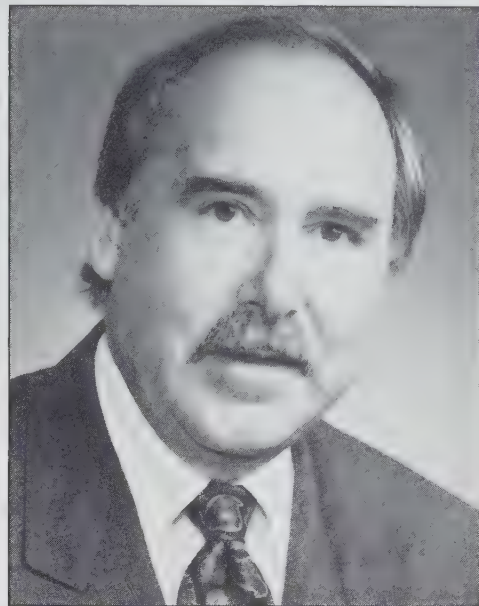
A committee at the University of Saskatchewan was recently given the task of looking at the school's academic vitality in relation to budgetary units. Although it was not part of the committee's mandate, it recommended the closure of the faculty of dentistry.

Recently, a concerted effort by the faculty and the dental community averted the loss of Saskatchewan's only dental school. An intensive education program was directed at the university, the politicians, and the public to make them aware of the school's true value. Although it is one of Canada's newest faculties — the school was founded in 1966 — it has contributed immeasurably to the supply of dentists within the province, particularly in Saskatchewan's vast rural area.

Canada's dental community will be watching and waiting for further developments relevant to the proposed closure at McGill. Δ

Dr. Phil Greeves named Alberta President

Dr. Phil Greeves, a general practitioner based in Calgary, became president of the Alberta Dental Association on July 1, 1991.



Dr. G. Phil Greeves, president, Alberta Dental Association

Dr. Greeves has served on various committees of the association over the years, and has been particularly active on convention committees for Manitoba (his home province), the CDA and the Pacific Dental Federation. He was first elected to the board of the Alberta Dental Association in 1987.

Born in Birtle, Dr. Greeves attended the University of Manitoba, receiving a B.Sc. from that school in 1964 and a PhD in dental medicine in 1968.

The other members of the 1991-1992 Alberta executive are Dr. G.D. Harle, past-president; Dr. J.W. Blair, president-elect and Dr. W.J. Hollingshead, vice-president. Δ

Tamar Portnoy Granted Dental Degree Posthumously

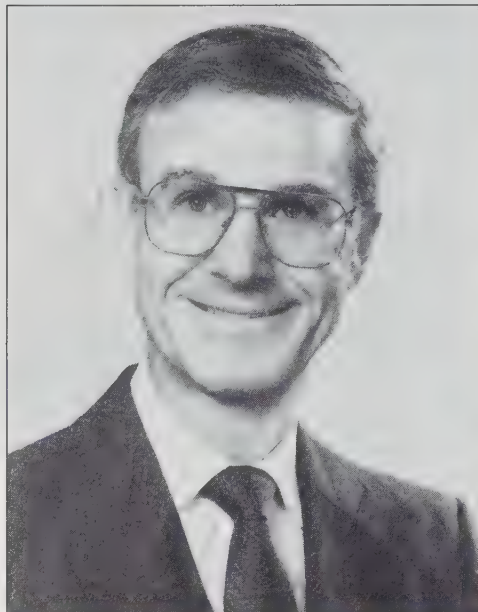
In a rare move, the University of Toronto has granted a posthumous doctor of dental surgery degree to Tamar Portnoy — who died in a tragic auto accident on February 23, 1991.

Tamar, known to her friends as Tammy, was born in Israel in 1965 and emigrated to Canada with her parents in 1968. She graduated from high school as an Ontario Scholar and entered the University of Toronto, where she earned a B.Sc.

On entering the faculty of dentistry in 1987, Tammy proved to be an outstanding scholar, achieving awards in oral surgery, orthodontics and periodontics. Her postgraduation plans included an internship at the Jewish General Hospital in Montreal and a career in either pedodontics or orthodontics. Δ

Dr. Michael D. Rennert Elected AAO Trustee

Dr. Michael Rennert of Montreal, Quebec, has been elected as a trustee of the American Association of Orthodontists (AAO).



Dr. Michael Rennert

It is the first time in the 90-year history of the St. Louis, Missouri-based association that a Canadian has been elected to the board of trustees.

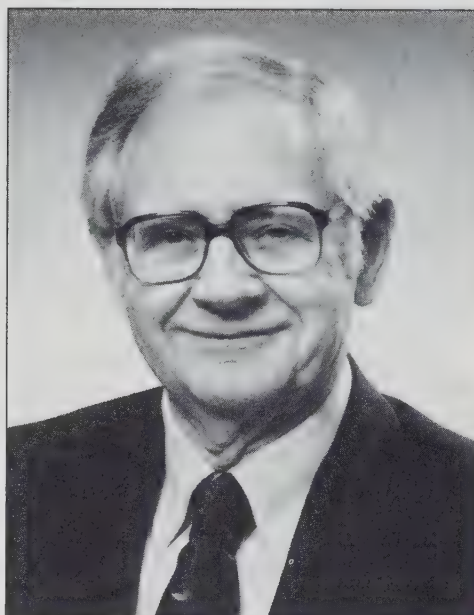
Dr. Rennert, who will represent the Northeastern Society of Orthodontists on the AAO board, received his dental degree from McGill University in 1963 and his orthodontic degree from the State University of New York at Buffalo in 1965. Since then he has combined a private practice in Montreal with a teaching career at McGill, where he is currently an associate professor. Until he stepped down, recently, Dr. Rennert was also the chairman of McGill's orthodontic department, a position he had held for 16 years.

A past president of the Quebec Association of Orthodontists, Dr. Rennet has held numerous positions in the Northeastern Society, becoming its president in 1983. He is a fellow of the Royal College of Dentistry of Canada, the International College of Dentistry and the American College of Dentistry. △

Dr. Ralph Phillips Dead at 73

Dr. Ralph Phillips, a pioneer in dental materials research, died in Indianapolis on May 17, 1991. He was 73.

Internationally recognized as an outstanding lecturer, Dr. Phillips appeared in more than 1,000 programs throughout the



Dr. Ralph Phillips

world. He is perhaps best known for his textbook, "The Science of Dental Materials," however, which became a standard for a generation of students. The ninth edition of the book, now translated into six languages, was released last March.

Dr. Phillips graduated from Indiana University with a B.Sc. in chemistry in 1940 and was quickly recruited to develop the school's dental materials program. He remained associated with the department for more than 50 years, as well as serving as a consultant to the U.S. surgeon general, the U.S. Public Health Service and the National Academy of Sciences.

Forever the student, Dr. Phillips earned his M.Sc. from Indiana in 1950 and a PhD in science from the University of Alabama 10 years later.

"Dr. Phillip's death is nothing less than the passing of an era. I think he inspired more people to dental materials science than anyone else," said Dr. John Stanford, a close friend of Dr. Phillips for over 40 years and the director of the ADA Council of Dental Materials, in a recent *ADA News* article. △

Canadian Students Win Research Awards

Two Canadian students won major awards during a recent Canadian Association for Dental Research (CADR) competition in Acapulco, Mexico. The competition took place during the CADR's annual meeting, which was held in conjunction with the meeting of the International Association for Dental Research.

1991 CADR Close-up Research Award

Lesley Ellies, a dental postgraduate in a combined PhD/prosthodontics program at

the University of Toronto, won the 1991 CADR Close-up Research Award sponsored by Chesebrough-Pond's Canada Inc. The award consists of a certificate, a plaque and a \$1,500 U.S. cash prize.



Dr. F.J.G. Van der Ouderaa from Unilever Research presents the CADR Close-up Research Award to Dr. Lesley Ellies.

Dr. Ellies received a B.D.Sc. degree from the University of Western Australia in 1981. After practising for a year at the Perth Dental Hospital, she moved to the United States to undertake a M.Sc. in the area of ceramic biomaterials at the University of Rochester. In 1985 she entered the University of Toronto and was awarded a Medical Research Council (MRC) of Canada Fellowship to support her research.

1991 CADR Crest Research Award



Dr. Barry McBride, president of CADR, presents the CADR Crest Research Award to Mr. Sayed Mirbod.



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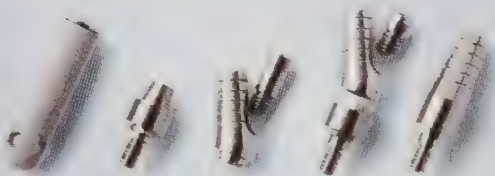
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Sayed M. Mirbod, a second year dental student at the University of Western Ontario, won the 1991 CADR Crest Research Award sponsored by Proctor and Gamble Inc. Mr. Mirbod's entry, entitled "Fibre Organization for Periodontal Ligament by Polarized Light Microscopy," was based on work he did as a summer student in the laboratory of Dr. H. Sandhu.

The Crest Award consists of a certificate and a \$1,000 cash prize. Δ

First Woman Dentist in Newfoundland Retires

The Newfoundland dental profession passed a milestone in April 1991, when Dr. Junia Langins — the province's first woman dentist — retired after more than 40 years of continuous practice in Corner Brook.



Dr. Junia Langins (right), Newfoundland's first woman dentist, says goodbye to her practice and assistant, Shery. "It has been a wonderful 40 years."

Dr. Langins, a native of Latvia, received her dental degree from the University of Heidelberg, Germany, shortly after the Second World War. Now 68, she and her family arrived in Newfoundland as war refugees in 1948. They settled in Corner Brook, where Dr. Langins opened her practice and her husband, a chemical engineer specializing in paper making, found employment with a pulp and paper company.

In 1949, a year after the Langins' arrival on the island, Newfoundland joined Confederation and became Canada's tenth province. At the time there were only 13 dentists practising full time in Newfoundland — two of them in Corner Brook.

Forty years ago, Corner Brook, Newfoundland's second largest city, still had some of attributes of a frontier town. When

Dr. Langins began her practice, dentistry was still considered by many to be a "man's job." It didn't take long for her healing skills and gentle nature to gain the respect of Corner Brook residents and change their attitudes about women dentists, however.

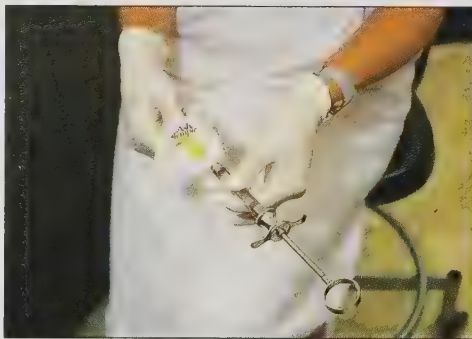
Today, as she "hangs up her hand-piece," Dr. Langins must feel great satisfaction over the vast improvement that has taken place in the standards of dental care in her adopted country in the last 40 years. Decay prevention is now a way of life in Canada, and extractions are becoming increasingly rare. The dental profession has grown, too. There are 150 dentists in Newfoundland today — 20 of them women. Δ

Ottawa Firm Develops NeedleGARD

Medicor, an Ottawa-based medical products company, has developed a simple and economic device to ensure the safe handling of needles.

Called the **NeedleGARD Shield**, the device provides health-care workers with a safe and easy means of recapping or uncapping needles. It also reduces the handling of unprotected needles, and is especially appropriate for cases involving progressive injections.

Constructed of pliable plastic, the NeedleGARD can be chemically sterilized. It is currently distributed to Canadian dentists by Ash Temple Limited.



NeedleGARD Shield assists safe handling of needles

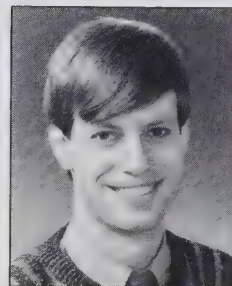
NeedleGARD is the inspiration of Ottawa resident Mark Sunderland, who has a background in electrical engineering and architectural design. While employed as a project manager for the construction of the Metropolitan Life head office in Ottawa, Mr. Sunderland did volunteer work with the Canadian Cancer Society and later with a palliative care service at the Ottawa Civic Hospital. It was during this period that he began working on various hospital related products. He incorporated Medicor in February 1988. Δ

CFDE Awards 16 Fellowships

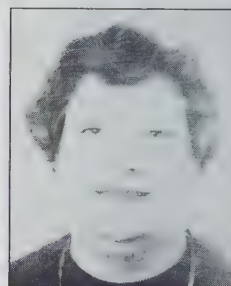
During its 1991 annual meeting, the Canadian Fund for Dental Education (CFDE) approved and awarded 16 teacher training fellowships for the 1991-92 academic year.

To date, CFDE's fellowship program, initiated in 1964 to help develop and maintain a pool of qualified teachers in Canadian dental and dental hygiene schools, has awarded 342 fellowships for a total of \$1,225,515.

Recipients of CFDE fellowship awards usually pursue two years of postgraduate study involving education courses, as well as courses related to their specialties. A firm commitment is made by each recipient to engage in a teaching career upon the completion of his or her studies, with a minimum of two years of teaching for each year of fellowship received.



Dr. Albert Jeffrey Coil



Ms. Charla Joyce Lautar



Dr. Benoît Lalonde



Dr. Corrine Machnee



Prof. Ellen Brownstone



Dr. Victor Wagner

This year's fellowship recipients are (fellowship renewals): Dr. Albert Jeffrey Coil (\$2,000), University of British Columbia, PhD program, endodontics; Ms. Charla Joyce Lautar (\$2,000), John Abbott College/McGill University, PhD in education combining dental hygiene, com-

“CDA is the voice of my profession. I just can’t imagine not being a member.”

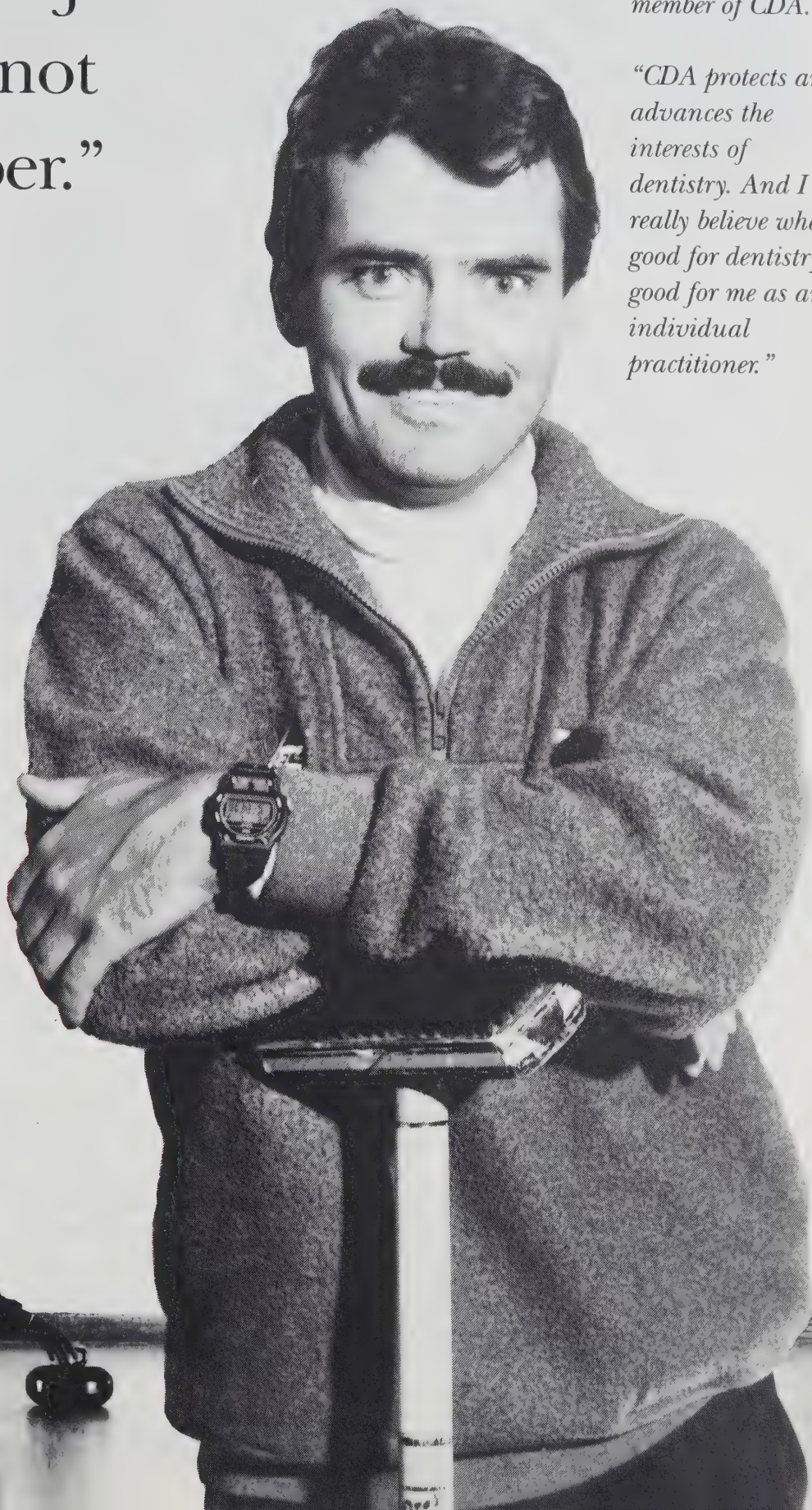
*Dr. Kardy Solmundson,
Winnipeg, Manitoba*

*Dr. Kardy Solmundson:
general practitioner,
curler – and
member of CDA.*

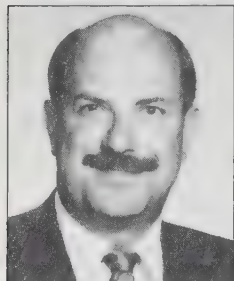
*“CDA protects and
advances the
interests of
dentistry. And I
really believe what’s
good for dentistry is
good for me as an
individual
practitioner.”*



The Canadian Dental Association is the national voice of dentistry – informing, educating, advising, advocating. It’s one of the ways CDA works for you, and for dentists all across Canada.



puters and education; Dr. Benoît Lalonde (\$2,000), universities of Montreal and McGill, oral medicine; Dr. Corrine Machnee (\$2,000), University of Saskatchewan, removable and fixed prosthodontics; Professor Ellen Brownstone (\$2,000), University of Manitoba (hygiene), higher education studies; Dr. Victor Wagner (\$1,500), University of Western Ontario, endodontics.



Dr. Robert S. Roda

Dr. Laura Eva Tam

New awards: Dr. Anne Charbonneau (\$1,000), University of Montreal, community health/clinical epidemiology; Dr. Robert S. Roda (\$1,500), Dalhousie University, endodontics; Dr. Laura Eva Tam (\$1,000), University of Toronto, biomaterials; Dr. Jane Morgan (\$1,000), University of Toronto, biomechanics and biomedicine in engineering; Dr. Debora Matthews (\$1,500), University of Alberta, periodontics; *Dr. Richard C.K. Jordan (\$1,500), University of Toronto, M.Sc. in oral pathology; Dr. Carole Brodeur (\$2,000), University of Montreal, operative dentistry; *Ms. Sharon Rogers (\$1,500), George Brown College (hygiene), environmental studies and health sciences; *Dr. Vivienne Allain (\$1,500), resident, Eastman Dental Center, periodontology.

In addition, the Henry M. Thornton Fellowship Award of \$1,000, sponsored by Dentsply Canada Limited, for the most deserving new applicant was shared equally this year by Dr. Laura Eva Tam and Dr. Jane Morgan. Δ



* As no applications were received toward the Warner-Lambert Canada Fellowship for an existing dental teacher, Warner-Lambert Canada, for this year only, has kindly made these funds available for distribution among the general fellowships, for which there was a tremendous need. The \$3,500 fellowship was shared by Dr. Vivienne Allain (\$1,500), Dr. Richard Jordan (\$500), and Ms. Sharon Rogers (\$1,500).

The CFDE extends its sincere appreciation to Warner-Lambert Canada Inc. and Dentsply Canada Limited for their generous assistance again this year.

Lederle Laboratories Support CFDE

Lederle Laboratories, a division of Cyanamid Canada Inc., donated \$2,045 to the Canadian Fund for Dental Education (CFDE) in June.

The donation was linked to the results of a survey the Markham, Ontario-based company conducted among 1,500 Canadian dentists on the future development and potential benefits of antibiotics to the dental patient. For each completed questionnaire Lederle received back from the dentists, who were selected at random from across Canada, the company donated \$5 to CFDE.



CFDE administrator Mrs. Julie Hentschel gratefully accepts a cheque from Mr. Leon Wahler, the manager of marketing research for Lederle Laboratories.

Lederle hopes the results of the anonymous survey – the dentists polled were asked not to identify themselves – will help to create long-term benefits for dental patients. CFDE has extended its gratitude to Lederle for the support and consideration it has received from the company.

CFDE, which relies on support from individual dentists, companies and corporations to meet its objectives, is dedicated to promoting good dental health by providing financial assistance to dental education and research. Δ

Erratum

In the caption that appeared with the story called "CFDE 1991-92 Awards Total \$225,440" in the August issue of the *Journal* (News Update section, p. 614), Dr. Robert Dupont was incorrectly identified as Mr. Robert Dupont. In addition, Dr. Bill Sharun was incorrectly identified as Dr. Bill Jharun. The *Journal* regrets the errors.

Ten Worthy Graduates Receive CDA President's Award

Ten outstanding 1991 dental graduates, one from each of Canada's dental faculties, were recent recipients of the prestigious CDA President's Award.

Selected on the recommendations of the faculty awards committee of each school, the winners are all graduates of dental undergraduate programs who have shown outstanding qualities of leadership, scholarship, character, and humanity. Each one is expected to have a distinguished career in the dental profession and to play a significant role in society at large. A cheque for \$250 and a certificate was presented to each winner.

The 1991 recipients are: Dr. David French, University of Alberta; Dr. William Tyler, University of British Columbia; Dr. Tim Dunmore, University of Manitoba; Dr. Scott MacLean, Dalhousie University; Dr. Patricia Allen, Laval University; Dr. Bruno Paliani, University of Western Ontario; Dr. Sante Aceti, University of Toronto; Dr. Eddie Reinish, McGill University; Dr. Caroline Schmitt, University of Montreal; Dr. Roma Pastershank, University of Saskatchewan. Δ

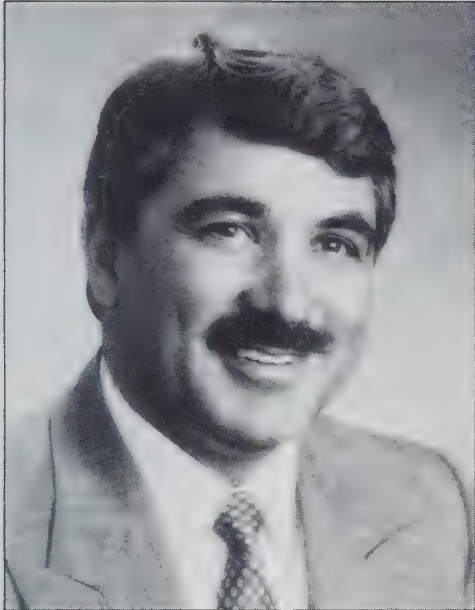


CDA Executive Council member, Dr. Bernie White of Saskatoon, presents the CDA PRESIDENT'S AWARD to Dr. Roma Pastershank, 1991 graduate from the University of Saskatchewan.

Dr. John Diggins Elected B.C. President

Dr. John Diggins, an endodontist in private practice in Vancouver, has been elected for his second term as president of the College of Dental Surgeons of British Columbia.

Dr. Diggins graduated from the faculty of dentistry at the University of British Columbia in 1972 and received his masters degree and specialty in endodontics from the University of Washington in 1979. He received his fellowship in the Royal College of Dentists of Canada in 1982.



Dr. John Diggins

Other officers elected to the B.C. college for the 1991-1992 term are Dr. Marke Pedersen, first vice-president; Dr. Don Scramstad, second vice-president and Dr. Jim Brass, treasurer. Δ

CDA Journal Visits Ivoclar

In recognition of the support given to the *Journal of the Canadian Dental Association* by Williams Gold Refining Company over the last 50 years, Dr. Ralph Crawford, the *Journal's* editor, and Ms. Marg Churchill of Keith Health Care Communications, who handles advertising sales for the magazine, paid a special visit to **Ivoclar North America's** Amherst, New York, plant recently. (Ivoclar is the parent company of Williams Dental.)

The Williams Gold Refining Company was founded in Kansas City by A.G. Williams at the turn of the century, although it probably had its roots in the Yukon, where Williams enjoyed considerable success during the Klondike Gold Rush of 1898.

Early on, Williams recognized that the development of precious metal alloys and ancillary services would be vital to the growing dental industry. To meet that need, his son, R.V. Williams, instituted the company's research program and launched an education department, headed by a den-



The *Journal* presents a plaque to Williams Dental in appreciation of 50 years of service and support to Canadian dentistry. Left to right, Dr. George Tysowsky, Ivoclar's executive vice-president; *Journal* editor Dr. Ralph Crawford; Mr. Brian Binnie, Williams' national sales manager; Ms. Lynne Cousins, National Sales Manager — Vivadent; Ms. Marg Churchill, sales representative, Keith Health Care Communications; Mr. Charles Cassar, Marketing Communications Manager.

tist, to teach new technical procedures to dentists and laboratory technicians.

Williams Gold was acquired by Ivoclar, N.A., in 1987. Ivoclar, an acronym for ivory and clarity, has its roots in a small artificial tooth factory that was founded in Liechtenstein in 1933. It remained a local enterprise until Dr. Adolf Schneider assumed ownership in 1948. Three years later, the company introduced the first vacuum fired porcelain tooth and changed its name to Ivoclar AG. By 1953 it had begun to produce synthetic teeth and was undertaking pioneering work in the development of microfil materials.

Ivoclar N.A., the conglomerate's North American subsidiary (Ivoclar AG has satellite plants and sales offices in 10 coun-

tries), is comprised of three companies — Ivoclar, Vivadent and Williams — which each have a distinct specialty. Its Canadian centre is in St. Catherines, Ontario.

Following his tour of Ivoclar's Amherst plant, Dr. Crawford presented a framed plaque bearing a page from a 1941 issue of the *Journal* to Dr. George Tysowsky, the company's executive vice-president of research and development. The inscription on the plaque reads:

The Journal of the
Canadian Dental Association
Presents This Copy of
Williams "1941" Journal Advertisement
In Appreciation of
50 Years of Support and Service Δ

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In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and/or permanent residents. The University of Toronto is an equal opportunity employer.

Application letters, accompanied by a detailed curriculum vitae, should be sent by October 31, 1991 to:

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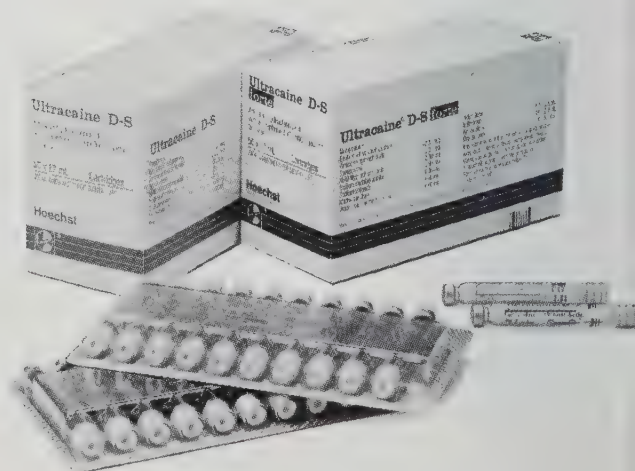
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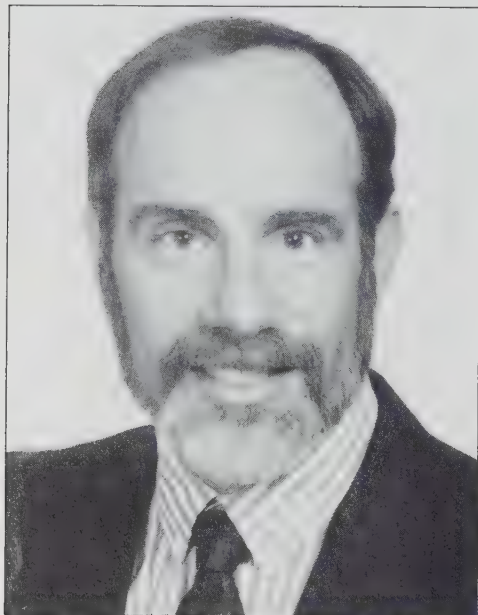
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Periodontal Care for Older Adults

Last May, a significant, two-day symposium, "Periodontal Care for Older Adults," was hosted by the Canadian Academy of Periodontology and the University of Toronto's department of periodontics. Moderated by Dr. Richard Ellen, the chairman of periodontics at U of T, the symposium brought together world renowned leaders in periodontics and geriatric dentistry.



Dr. Richard Ellen: Chairman, department of periodontology, University of Toronto.

Dr. Harald Loe

The keynote address was given by Dr. Harald Loe, the director of the National Institute of Dental Research (NIDR) in Bethesda, Maryland.

Dr. Loe reminded the audience that the life span of the average person in North America is around 75 years. "There is a new age in history — an age-age. But 75 is not the end point. There are more than three million people over the age of 85 in North America today, and it is estimated that there may be as many as 50 million by the middle of the 21st century."

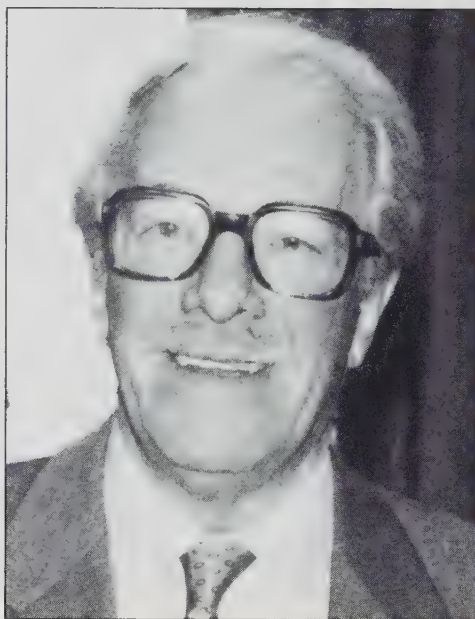
A number of researchers, including Dr. Loe, are now trying to estimate just how long humans would live if chronic disease was wiped out. One theory states that animals can live six times the number of years that it takes for them to mature. Following on this theory, then, it could be possible for the human animal to live six times 20 years, or a maximum of around 120 years. Dr. Leonard Hayflick's cell multiplication studies have produced similar results. He estimates the maximum human life span to be about 110 years.

While aging is often synonymous with the degeneration of the human body and

organs, the oral maxillofacial organ — despite its incredible complexity — is influenced to a surprisingly small degree by aging per se.

In 1986, NIDR conducted a national survey on the oral health of working Americans and senior citizens. The study incorporated about 25,000 individuals, 5,000 of them 65 or older. Today, only four per cent of working Americans between 18 and 65 years of age are edentulous. However, the rate of edentulousness in the over 65 group is more than 10 times that of the younger group, or about 50 per cent. Seniors also have three times more root caries than young people and more periodontal disease.

Over the past 150 years, dentistry has evolved in three phases. The first phase involved relieving pain; the second developing technology to save teeth by filling them; and the third phase — what we face now — prevention. Today dentists can



Dr. Harald Loe: director of the National Institute of Dental Research, Bethesda, Maryland.

take advantage of a wide range of new prevention methodologies because of what the research conducted during the third phase has taught us about oral disease.

Dr. Loe concluded, "If we are to capitalize on the growth of research, we must ensure that the students' role and the curriculum are contributory. We need more internal medicine, more genetics and more molecular medicine. More emphasis must be placed on pharmacology, normal aging and geriatrics. We must see an increased emphasis on behavioral science."

Following Dr. Loe's address, eight other speakers presented papers during the first day.

During the final day of the symposium, eight working groups dealt with a variety

of topics relevant to the aging patient: collective living centres, the cost of long-term care, access, dental health promotion, pharmacology-therapeutics, educational models and research. Leaders from each group reported back to the main body, where a question and answer session ensued.

In concluding the symposium, moderator Dr. Richard Ellen said that many problems concerning the aging periodontal patient were raised during the two days. "But much remains unanswered," he said. "I hope the symposium proceedings stimulate research and solutions to problems." Δ

Dr. Ellen also expressed thanks to Colgate-Palmolive Canada for their financial support, and to the Ontario Ministry of Health, which granted funds toward publishing the symposium's proceedings in book form.

Health and Welfare Funds National Survey on Elder Abuse

Dr. Douglas Galan, of the University of Manitoba's faculty of dentistry, has been awarded a grant of \$14,390 by Health and Welfare Canada to investigate "Elder Abuse and the Dentists' Awareness and Knowledge of the Problem."

The problem of elder abuse is being identified more and more frequently by health care professionals working with older adults. Considering that 38 per cent of abuse incidents involve head, neck and/or facial injuries, it is easy to conceive a role for dentists as a fundamental group involved in abuse detection.

The project, scheduled to begin October 1, 1991, will consist of a short questionnaire, which will be mailed to a random sample of 2,200 Canadian dentists. The questionnaire will ask for basic demographic, geographic, and dental practice information, along with additional information on knowledge and awareness of elder abuse, and whether or not the selected dentists have seen or treated injuries which they suspect may have been attributable to abuse.

The collected information will ultimately contribute to the desired goal of improving the dental profession's contribution to the safety and well-being of Canada's older population. Δ





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October 10: Toronto (4:00 p.m.-9:00 p.m.) Sheraton Centre Hotel, Dominion Room, 123 Queen Street West

October 11: London (2:00 p.m.-7:00 p.m.) Centennial Hall, 550 Wellington Street

If you would like to know more, but are unable to attend, call collect (416) 327-8730.



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Too Much Packaging

After receiving the last issue of your *Journal* (May 1991) I was quite disappointed to note the excess packaging that came with it. The *Journal* was wrapped in a plastic bag, contained a large white piece of cardboard with only my address on it, an ad for Butler toothbrushes and, finally, a cardboard stand concerning the census.

I usually enjoy reading the *CDA Journal*, but I feel that advertising flyers should not be included. However, keeping ads limited to the *Journal* pages seems to be a better idea and the avoidance of flyers would

relieve the need to wrap everything in a plastic bag.

Could the CDA try to find a way to avoid extra packaging? Just out of curiosity — is the *CDA Journal* printed on recycled paper?

*Dr. Mary MacKinnon, DDS
Kirkland Lake, Ont.*

Editor's Response

As a magazine published to serve the needs of organized dentistry, the *Journal* is naturally concerned with both recycling and over packaging.

To that end, the *Journal* is only wrapped in plastic bags in those months when loose advertising material is enclosed with the magazine. Furthermore, the bags used for this purpose are biodegradable.

The *Journal* began carrying loose advertising supplements at the request of our advertisers. These supplements generate revenue for the magazine, and therefore help to defray its production costs. This, in turn, makes more money available to CDA's other activities, and thus benefits organized dentistry as a whole.

In regards to your question on recycling, we are currently looking at the feasibility of printing the magazine on recycled paper. Until recently, however, the price of recycled paper relative to the price of an equal grade of non-recycled paper made this option cost ineffective. In addition, the processes used to produce the kind of high-quality recycled paper required by the magazine industry are extremely harmful to the environment. This factor can be alleviated to some extent through the use of vegetable-based inks, but these inks are expensive, and there are not many printers who stock them.

Therefore, unless the price of recycled paper drops considerably in the near future or the processes used to produce magazine-grade recycled paper become more environmentally friendly, the *Journal* will probably continue to be printed on non-recycled paper. However, we will not hesitate to switch to recycled paper when and if these two conditions are met.

*Terence Davis
Managing Editor*



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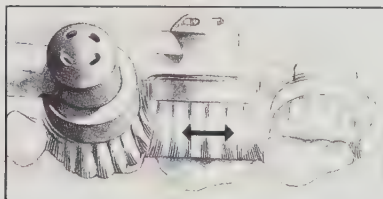
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Child Abuse and the Role of the Dental Practitioner

Les mauvais traitements infligés aux enfants et le rôle du dentiste

1. Ambrose, J.B. "Orofacial signs of child abuse and neglect: a dental perspective." *Pediatrician*. 1989; v. 16(3-4), pp. 188-92.
2. Bernat, J.E. "Child abuse and neglect: dentistry's role." *New York State Dental Journal*. Mar. 1988; v. 55(3), pp. 34-7.
3. Blain, S.M. and Kittle, P.E. "Child abuse and neglect — dentistry's intervention." *Update in Pediatric Dentistry*. Apr. 1989; v. 2(2), pp. 1-7.
4. Carpenter, C. "Child abuse recognition and reporting: putting an end to a destructive cycle." *New York State Dental Journal*. Mar. 1991; v. 57(3), pp. 27-9.
5. "The dentist's responsibility in identifying and reporting child abuse." *Illinois Dental Journal*. Part I: Jan.-Feb. 1989; v. 58(1), pp. 26-9, Part II: Mar.-Apr. 1989; v. 58(2), pp. 86-8.
6. Elliott-Wellwood, J. "Guidelines for dental professionals: early detection and prevention of child abuse." *Probe*. Summer 1989; v. 23(2), pp. 85-7.
7. Fleck, R.T. "Child abuse and neglect — the dentist's duty to report." *GMDA Bulletin*. Jun. 1988; v. 55(6), pp. 182-4.
8. Francis, J.L. and others. "Child abuse: detecting and reporting." *Journal of the Indiana Dental Association*. Nov.-Dec. 1987; v. 66(6), pp. 19-21.
9. Gerber, P.C. "Child abuse — is dentistry doing its part to stop it?" *Dental Management*. Sept. 1988; v. 28(9), pp. 28-9, 32-4.
10. Hamilton, J. "Child abuse: the dentist's responsibility." *CDS Review*. Oct. 1990; v. 83(9), pp. 18-23.
11. "Health professionals strive to protect children from abuse." *Bur*. Fall 1988; v. 91(4), pp. 4-5.
12. Kassebaum, D.K. and others. "Recognition and reporting of child abuse: a survey of dentists." *General Dentistry*. May-Jun. 1991; v. 39(3), pp. 159-62.
13. Konvalinka, K.R. "Child abuse: ethical and practical considerations for the dental team." *Journal of the Michigan Dental Association*. Mar. 1988; v. 70(3), pp. 139-42.
14. Paterson, C.R. and McAllion, S.J. "Osteogenesis imperfecta in the differential diagnosis of child abuse." *BMJ*. Dec. 9,

1989; v. 299(6713), pp. 1451-4.

15. Siegel, M.B. and others. "Mandibular fractures in the pediatric patient." *Archives of Otolaryngology — Head and Neck Surgery*. May 1991; v. 117(5), pp. 533-6.

16. Sperber, N.D. "Bite marks, oral and facial injuries — harbingers of severe child abuse?" *Pediatrician*. 1989; v. 16(3-4), pp. 207-11.

New Arrivals

Books

Carranza, Fermin A. and Kenny E. Barrie. *Reconstructive periodontics*. Philadelphia: Saunders, 1991. Dental Clinic of N.A. vol. 35(3).

Croll, Theodore P. *Enamel microabrasion*. Chicago: Quintessence, 1991.

Martin, Brian. *Scientific knowledge in controversy: the social dynamics of the fluoridation debate*. Albany, NY: State University of New York, 1991.

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The DAP Advisor offers information, ideas and advice to improve dentist-patient communication, raise awareness about good dental health, and help your practice become busier.

Being an effective communicator means understanding and making judicious use of your body language — those non-verbal cues that tell the patient how you really feel.

Body Talk: How Good Body Language Can Help You Communicate with Patients

No one would question the fact that two of the main attributes an effective communicator must possess are an ability to talk and a willingness to listen. But there is a type of communication that has nothing to do with the spoken word. A kind of communication that is entirely non-verbal, and that relates to the way people comport themselves and the unspoken cues of their body language.

The concept of body language is not particularly new — anthropologists and psychologists have been investigating it for years. Even so, body language remains a living art, retaining its timeliness and pertinence, especially for people who spend their professional lives dealing with the public.

It is crucial to realize that what you say can often be supported or undermined by *how* you say it. For that reason, you must remain constantly aware of your non-verbal communication techniques — and take the time to consider the reaction they are likely to evoke. That way, you can become an effective body talker and use your body language to help establish and maintain good rapport with your patients. And that, in turn, can be the basis of many successful and long-lasting relationships.

Here are a few suggestions that can help you to refine and hone your body language skills:

- **Look in the patient's eyes.**

Eye contact is one of the most important ways in which people connect with each other. In fact, it is difficult, if not impossible, to conduct an effective conversation with someone who averts his or her gaze, or without looking into that person's eyes yourself. Avoiding eye contact can make people think that you either have something to hide, or are so uncomfortable or insecure that you find it almost painful to look them in the eyes. At the same time, eye contact should be as natural as possible. An unbroken stare can be both unpleasant and unnerving.

- **Talk at the patient's eye level.**

This point has been made in a previous *DAP Advisor*, but it is so essential that it bears repeating. One of the reasons why some people find it disconcerting to go to the dentist is that it gives them a feeling of powerlessness. Talking to a patient from behind the broad expanse of your office desk, or as you loom above him or her in the operator chair, may well reinforce this feeling. On the other hand, you can help to dispel it by coming out from behind your desk, or pulling up a stool and talking to the patient at eye level — the level of equals.

- **Respect the patient's space.**

Generally, people have a comfort zone around them of about 18 inches. Encroach on that space, and they may feel threatened or even claustrophobic. It is thus a good idea, when talking to a patient in your office, to allow that person some elbow room. Try not to make up the 18 inches, however, by slumping or leaning way back in your chair. Those non-verbal cues connote a lack of interest in what the patient is saying.

- **Be aware of your hands.**

Your hands are one of the most powerful tools for non-verbal communication. Used positively, your hands can be very expressive in conversation and can help you to emphasize a point. Used inappropriately, however, your hands can have a negative effect. For example, scratching your head during a discussion tells a patient that you are confused or puzzled — not exactly the sort of qualities likely to inspire great confidence in your ability. Scratching your neck demonstrates your discomfort with a situation. Looking at your watch indicates that you are in a rush, and don't consider the patient important enough to be taking up your time. Emphasizing a thought by keeping your fingers together and pointing them upward may be interpreted as pomposity. And keeping your hands hidden behind folded arms communicates that you are not very receptive to what the patient has to say.

- **Smile.**

It is vital for you and your dental team members to make an effort to smile, not only because you spend your working day showing people how crucial a healthy smile is to the quality of their lives, but because smiling is such an effective way of connecting with others. A genuine smile from you and your team members is apt to beget smiles from your patients. It will also help put them more at ease, demonstrate your interest in and concern about them, and foster a pleasant office environment — the kind of environment, in fact, in which it is a pleasure to work and to which patients will probably want to return.



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Please take a moment to look around your practice, particularly at the dedicated staff that contributes to its success. These people are important to you. You are important to them.

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- They will appreciate your interest in their welfare, which you will demonstrate by satisfying their need for security.
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- People like the "package" format because it simplifies applying for coverage.
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If you wish to proceed, and bring the dentists' staff insurance package into your practice, you have the choice of two options: one, you can make information on the package available to your staff members and let them decide if they wish to participate in it on their own; or, two, you can use the insurance package as part of an employee benefits package, sharing as much or as little of the premium costs as you wish with the employees.

Either way, the insurance must be applied for by individual employees and the



costs must be invoiced to them. A separate application must be completed by each employee.

To get the required number of applications and/or more information, please call or write Canadian Dental Service Plans Inc. (CDSPI).

All full-time employees under age 65, who work at least 20 hours per week for at least one eligible dentist, may apply for coverage. An eligible dentist is one who is a member of CDA or a co-sponsoring provincial association.

Please give this matter your serious consideration. It is important to you, your staff and the future of your practice.

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Let's Talk is an open letter to dentists from Dr. Mel Charendoff, the president of CDSPI.

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Robi Klausz — Adversity and Survival

P. Ralph Crawford, BA, DMD

This is a dental story. It is the story of Robi Klausz, a Toronto laboratory technician who came face to face with the proverb, "If thou faint in the day of adversity thy strength is small."

Robi faced an agony of adversity, but his strength to overcome was immense.

The native of Hungary was only 14 when he apprenticed as a laboratory technician. Two years later, in 1957, he arrived in Toronto and immediately found employment in a commercial laboratory. But he had a dream that he never lost sight of — to own his own business. It took 10 years for Robi to reach that goal.

In 1967 he moved onto Weston Road and founded Klausz Dental Laboratories Ltd.

Like many small entrepreneurs, Robi built his company into a successful enterprise through long hours and hard work — and the support of a good wife. Susan Klausz, between caring for the couple's two small sons, Ron and Steve, assisted her husband by taking charge of the company's general office and accounting responsibilities.

The business began to thrive. New accounts came on board, additional staff was added, and the facilities underwent expansion. Everything seemed to be going along wonderfully.

Until December of 1974. That was when Robi suffered a cardiac arrest that rendered him virtually helpless and put him in the hospital for a full year. He was soon told that he would spend the rest of his life in a wheelchair.

Robi Klausz, wife Susan and sons did not faint in their day of adversity. Their strength was not small.

Susan Klausz, in a soft, quiet voice, remembered that during Robi's first month of illness their company lost two-thirds of its laboratory business. In between visiting her sick husband every day, she struggled to win back the confidence of their accounts — becoming the office public relations specialist.

Today she gives a great deal of credit for the company's turnaround to her staff. "They really pulled it out," she said. "They all stayed on, everyone of them. They showed tremendous loyalty."

Robi returned to his laboratory at the end of his year in the hospital. Unable to work



Klausz Dental Lab Ltd — "it's a family affair." Left to right, Ron, Robi and Susan.

at the lab bench from his wheel chair, he has taken over the company's dispatching duties. But he is always on hand to advise and consult.

With a twinkle in his eye he said, "It's good for them to have an old man around to help them out."

Asked what went through his mind during the terrible year in hospital, knowing he would be confined to a wheelchair for

the rest of his days, Robi replied simply, "One has to survive."

The strength of the man was further revealed when he was asked if he ever felt sorry for himself. "No," he said, "I have no time for that."

Ron Klausz was just a young lad when adversity struck his small family, but he seemed to grow as a result of it. By the time he was 14, Ron was working summers in the laboratory. From high school he entered the three-year laboratory technician's course at Toronto's George Brown College of Applied Arts and Technology. He graduated with honors in 1989 and within a year he had obtained his registered dental technician certificate.

It is evident that the younger Klausz, he's only 23, is now in charge of the laboratory — there is a staff of nine, these days, plus the three family members. "Ron represents the new image and the new reputation upon which we are building," said Susan.

There is little doubt that the company is still very much a family affair. Each family member takes much pride in the other's achievements as they work toward a common goal. They have faced too much adversity to lose strength now. Δ



Staff at the lab bench. "They showed tremendous loyalty."

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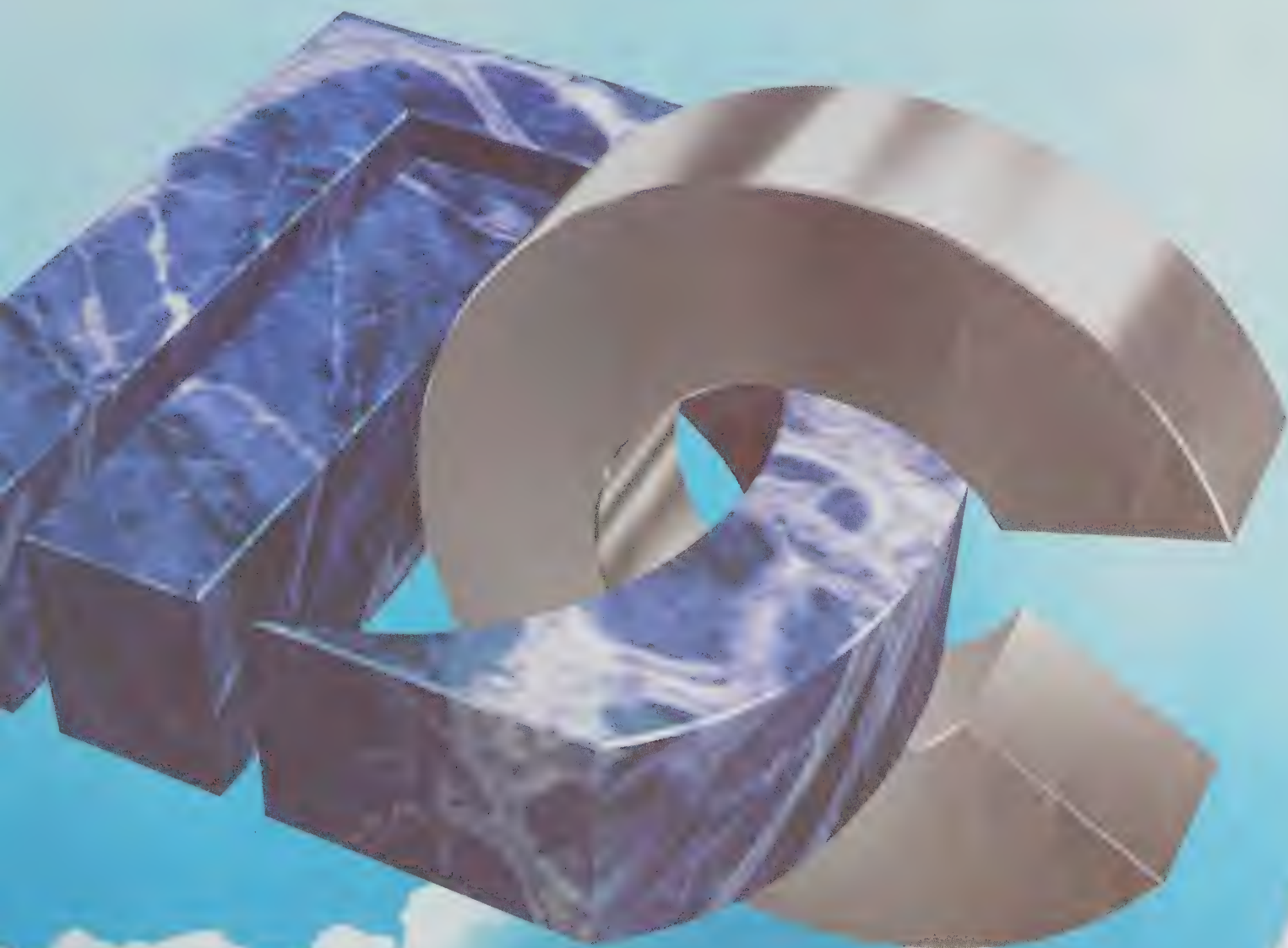
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Meet the President — and his Father

Dr. Les Allen was installed as the 72nd president of the Canadian Dental Association August 23 during the annual meeting of the CDA Board of Governors, held in Quebec City.

Born in Winnipeg in 1942, Dr. Allen received his professional training at the University of Manitoba. He first entered the faculty of dentistry in 1962, but left the dental program at the end of the first year to study business administration.

Dr. Allen earned his B.Comm. degree in 1965 and pursued a career in the commercial world. He soon decided to resume his education, however, and returned to second year dentistry, earning his DMD in 1969.

After graduation, Dr. Allen immediately joined his father, Dr. Harvey Allen, in a family practice located on Ellice Avenue in the west end of Winnipeg. It was here that an interesting heritage of father-son dentistry and service to the profession unfolded.

Dr. Harvey Allen, now 73, graduated from the University of Alberta in 1940. In April 1941 he joined the Canadian Forces as a dental officer. He served overseas with the No. 9 Dental Company, returning to Winnipeg in December 1945 at the end of the Second World War. Since then, he has continued an active practice and is often referred to as "one of the pillars" of organized dentistry in Manitoba.

The doctors Allen were the first father and son team to serve as presidents of the Manitoba Dental Association — Harvey in 1963-64 and Les in 1985-86. Both have also been part-time staff members with the University of Manitoba's dental faculty — Harvey in the early 1960s, when the faculty was in its infancy, and Les from 1969-1978.

In fact, there probably hasn't been a committee of the Winnipeg Dental Society, the Manitoba Dental Association or the Canadian Dental Association in which either or both Allens have not served in some capacity.

Thus, interviewing the doctors Allen provided the Journal with a unique opportunity to talk to a father-son dental team whose experience in dentistry and association affairs spans more than half a century. The interview was conducted by Dr. P. Ralph Crawford, the Journal editor, who paid a casual visit to the Allen's modest family practice in July. It is located in an area of Winnipeg where the ethnic mix has changed at last three times in as many decades.

(For the purposes of this interview, Dr. Harvey Allen will be referred to as "Dr. Harvey" and the new CDA president, Dr. Les Allen, as "Dr. Les.")

Journal: First of all, how do the two of you get along in practice? Obviously your practice works well, because it has lasted over 20 years. Which one of you is the boss?

Dr. Harvey: At the beginning Les was an associate, and I can tell you that he was getting a really good percentage. I made the major decisions and did the purchasing, in consultation with Les, but as time went on the responsibilities shifted. I can't think of a time when we had a serious disagreement — we never stinted on anything for the practice.

Dr. Les: It remained Dad's practice and office until 1984, when another associate, Dr. Jory Stillwater, and I actually took over the



Dr. Les Allen, CDA president, and his father, Dr. Harvey Allen, in their Winnipeg family practice.

practice, the building and the land. For the first 13 years of practice I was strictly an associate.

Journal: There must have been different approaches to practice between the two of you.

Dr. Harvey: There certainly were, when you compare my early days and former associates. In the 1940s there were three of us in this office with one assistant each and no receptionist. Today, Les and his associate have two assistants each, plus hygienists and receptionists.

Journal: Dr. Harvey, how much time do you spend in the office now?

Dr. Harvey: I have been working half-days for the past couple of years. I go to work around eight each morning and see three to five patients. I also do consulting work with Manitoba Blue Cross.

Journal: Dr. Harvey, you returned to Winnipeg following your service overseas and discharge from the Armed Forces. How easy was it start a practice in 1945?

Dr. Harvey: The biggest problem was finding a place to practice. Most of the medical-dental buildings were full. I became quite concerned until Dr. Isadore Wolch invited me to join him on Ellice Avenue, and here I have remained for over 45 years.

Journal: How was the supply of patients in those early days?

Dr. Harvey: We were fortunate. In 1945 and 1946, the demobilized members of the Armed Forces were all given the opportu-

nity to have their dental needs brought up to date. Also, those were non-fluoride days. We kept very busy.

I don't know how anyone could possibly be an anti-fluoridationalist. I shudder when I think back to those rampant caries days. I remember making dentures for 12-year-olds.

Journal: Can you recall what your net income was for your first year of practice?

Dr. Harvey: Quite clearly — it seemed like a lot of money in those days. My net "take-home" was \$8,000. The gross was around \$26,000. Remember, those were the days when we never charged for a check-up. A prophylaxis was \$2 and an extraction was \$3.

Journal: Dr. Les, we have been listening to your father talk about his early years in practice. You graduated in 1969. Do you think things were a little easier in 1969 than they were in the 1940s?

Dr. Les: I imagine every era thinks they have their own particular problems. I guess I was very fortunate. I had a practice waiting for me in Dad's office.

Besides, the graduates of my day were stepping out into what is often called the "golden age" of dentistry. The economy was good, dental insurance was becoming common place and the emphasis on prevention was beginning to take hold. There were enough patients.

I shudder when I think back to those rampant caries days. I remember making dentures for 12-year-olds.



Journal: It seems the golden age of dentistry has passed. Can you comment on today's "busyness" factor?

Dr. Les: There is no doubt that the decrease in the caries rate has had an effect on the busyness of dentists. The CDA has had effective discussions with the dental faculties and there have been reductions in enrolment in many of the dental schools. There is no sense in graduating dentists if there isn't enough for them to do.

The greatest concern I have in this area is that the dental schools maintain the quality of applicants. I would also hope that the graduates of today do not have unrealistic expectations. That they don't see the fine standard of living that my father and I have enjoyed and expect that this will be available quickly. Things are different today for new graduates.

The graduates of my day were stepping out into what is often called the "golden age" of dentistry.

The patient pool is down and the costs of setting up practice are astronomical. I don't think it is possible to start a truly viable practice for less than \$150,000 to \$200,000. I am concerned that the new graduate, burdened with debt and a small patient pool, may, with lack of experience, become involved in treatments that

they may not be totally familiar with. These are concerns which all of us in organized dentistry have to face in the upcoming years.

Journal: What is the Canadian Dental Association doing about the patient pool and dentists becoming involved in unfamiliar treatments.

The patient pool is down and the costs of setting up practice are astronomical.

Dr. Les: Let's talk about the patient pool first. The CDA started the Dental Awareness Program in 1985 with this in mind. A large amount of money has been expended in this area and the DAP has been one of CDA's most successful ventures over the past six or seven years. There has been a definite increase in office visits by patients right across Canada. More people are attending dental offices on a continual basis than ever before.

One of the marks of success is being copied. Individual provinces are now operating their own dental awareness plans.

There are still many dental problems in the community — restorative, cosmetic, periodontal. Individuals who are patient can still develop a good dental practice if they have a fair mind on how to treat patients — if they are honest and forthright about the patients' needs. There is dental work to be done for all the citizens of the land, but dentists can't expect to open a practice tomorrow and have a net income that provides for a large home, a fancy car, a summer cottage and winter vacations.

I didn't have high expectations for dollars and cents when I graduated. And I realize I have been most fortunate. The same opportunities are available to graduates of today if they are patient and do good dentistry.

It is extremely important to maintain a high level of membership in Ontario and Quebec. This is a major problem. We have to convince the non-members that national dentistry is worthy of their support.



Journal: Dr. Harvey, in your 50 years of dentistry, what are the biggest advances you have witnessed?

Dr. Harvey: Certainly fluoride, but we can't overlook the high-speed drill in the late 1950s. What a difference that little Borden engine, attached to the unit arm, made to a restorative practice. We went from preparing jacket crowns with steel burs, green stones and carborundum discs to diamonds and high speed. We also had tremendous changes in impression materials — when I first started all we had was plaster and compound.

Journal: Dr. Les, we have heard your father outline some of the problems in his early days. Can you outline for us the prime prob-

lems or priorities facing the Canadian Dental Association in the next few years — your greatest concerns. And what are you, the new president, going to do about them?

Dr. Les: Certainly, one priority is the relationship the Canadian Dental Association has with its membership across Canada.

As you know, we have eight provinces that have mandatory membership in CDA. The two largest provinces, Ontario and Quebec, are voluntary.

He doesn't tolerate fools gladly and he has a short fuse when he thinks people are promoting issues for their personal benefit rather than for the universal well-being.

At the present time, approximately 50 per cent of the dentists in Quebec and Ontario belong to CDA. This creates continuous concern about the dollars required to operate a national association that provides benefits to every Canadian dentist. Effective programs can only be funded from two sources — member dollars and non-dues revenue. It is extremely important, therefore, to maintain a high level of membership in Ontario and Quebec. This is a major problem. We have to convince the non-members that national dentistry is worthy of their support.

Communication with all the dentists in Canada is another priority. I have had an opportunity to play a significant role in the changes that have occurred in the way CDA communicates with the membership and the corporate bodies, as well as the public and the media.

Within this sphere I include the national-provincial relationships that are very important to a national association like ours.

We have expended a great deal of effort over the past several years on infection control procedures. Although I believe we have done an outstanding job on behalf of the public and on behalf of dentistry, I know this is going to be an ongoing priority over the next few years until the public's fears about infection control procedures have been laid to rest. We are all looking forward to the day when the ability to fight and control the spread of HIV and AIDS is a reality.

There is a problem that many dentists view as being minor that could blossom into a larger concern. I refer to the certification of dentists who have not been educated in Canada. Specifically, there are two categories — the Canadian students who have graduated from American schools and the large number of dentists who have immigrated to Canada.

Journal: Do we understand that you are in full agreement with one national certification entity, such as the National Dental Examining Board, as opposed to individual provincial examinations.

Dr. Les: Absolutely.

Journal: What is the Canadian Dental Association doing about this?

Dr. Les: The CDA, immediately following the annual meeting in Quebec City, is sponsoring a symposium on national certification. For two days all the major players in certification — licensing bodies, dental associations, dental faculties, accreditation and examining groups — will thoroughly debate the issue. Hopefully, by the time this interview is read, many of the problems will have been allayed.

Journal: Dr. Harvey, as a father, you have heard your son relate some of the major issues confronting national dentistry today. What characteristics does he possess to give the leadership required to solve these problems.

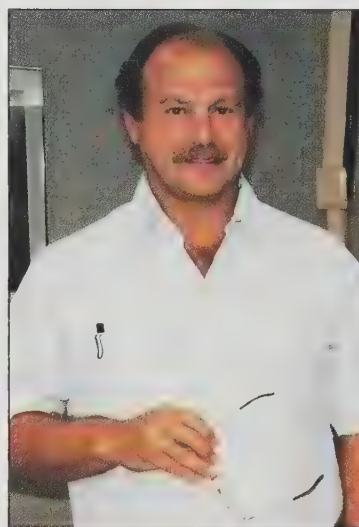
Dr. Harvey: You know how to put a father on the spot, don't you. Certainly I have a bias, but I will try to be honest. I know my son very well and I'm proud of the father-son-dentist partnership we enjoy.

Les can see through a problem and come up with a workable solution very quickly, far quicker than I can. But he has to work harder at determining that things are not all black and white. He has to learn to accept that there are grays in this world. He doesn't tolerate fools gladly and he has a short fuse when he thinks people are promoting issues for their personal benefit rather than for the universal well-being.

Journal: Dr. Les, there was a restructuring of the accreditation organization last year. We witnessed a move from a Council of Accreditation "controlled" by CDA to a new autonomous body, the Commission on Accreditation. Has this presented any problems?

Dr. Les: Not at all. Nor did the old Council of Accreditation have any real problems. But it is important that all those involved in accreditation, including the public, have the perception and comfort that CDA is not setting the standards for dental schools, which, ultimately, will control graduating dentists.

Today the Commission on Accreditation is autonomous, with well-balanced representation. The CDA has representation, as does the National Dental Examining Board, the licensing boards, the dental hygienists, and the public. The commission stands on its own decisions without having to report back to CDA. There can be no doubt in the public mind that the system is fair and equitable.



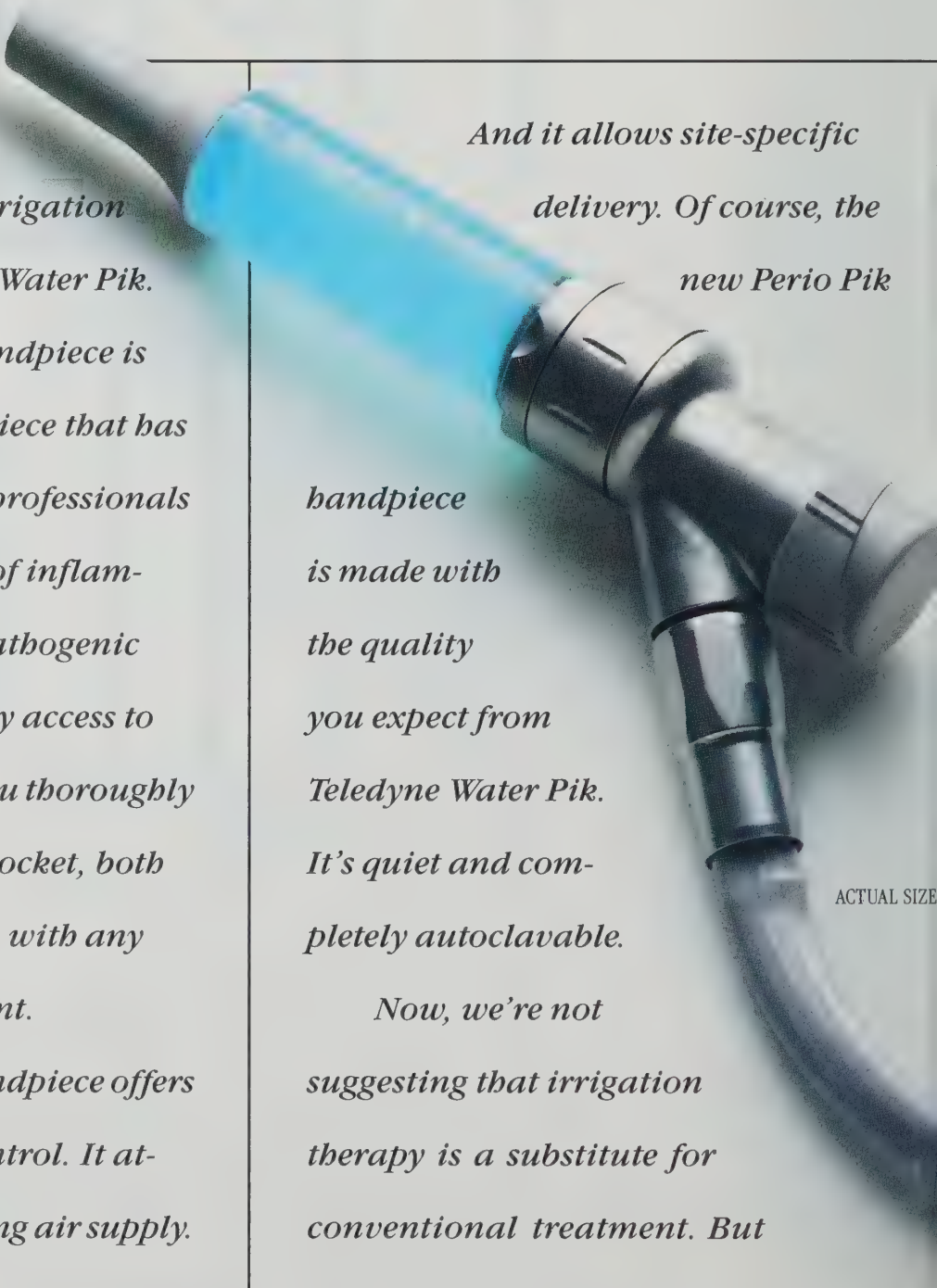
There were key issues that required the association to be pro-active rather than trying to explain matters after the fact.

Journal: Our friends in Quebec? It is heard in dental circles that there is a multi-million dollar law suit between the CDA and the Quebec Dental Association. What is this all about and is this going to cost every dentist in Canada money?

Dr. Les: I don't want to appear as if I am trying to avoid this question, but I am limited in what I can say. The law suit is about the surplus of funds created through the CDIP plans. However, because the matter is before the courts, we all have strict instructions not to comment on it. I personally don't believe it is going to cost Canadian dentists money and am confident that it is going to be resolved once and for all.

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Journal: In 1990 the CDA had a small deficit, after budgeting for an excess of revenue over expenditures. What has caused this change and what can we look forward to in the coming years?

Dr. Les: There were a number of items that caused the small deficit in 1990, and I am sure the members will agree that the decisions taken then were valid. At least the feed-back I am receiving indicates an agreement with our fiscal responsibility.

One important area is communications, including the *Journal*. There were key issues that required the association to be pro-active rather than trying to explain matters after the fact. Specifically I am referring to CDA's ability to respond before and after the "60 Minutes" segment on mercury in dental amalgam.

Another was the flow of information on the GST. This was a very confusing area, and it was CDA that led the way out of the darkness. The GST Manual put together by Dr. Bob Hicks and his taxation committee became a guide not only for dentists but for other professional groups as well.

Infection control is another area where CDA has given exceptional leadership. The dental community and the public are exposed daily to articles in the lay press concerning HIV and AIDS. This required a large communication effort on our part. The AIDS conference sponsored by CDA in April certainly enhanced our responsibility factor.

In a larger area, CDA had an opportunity, three or four years ago, to become involved in electronic data interchange — today known as CDAnet. The amount of money required to get this program under way has exceeded original expectations. However, these are dollars we expect to recover in the coming years.

Journal: Why did all the focus and the costs of setting up EDI take place in Ontario?

Dr. Les: Despite individual provinces believing that they are on an equal footing with Ontario, the reality is that there are over 6,000 dentists in Ontario. This represents over 35 per cent of all Canadian dentists and a large, large majority of the insurance plans in the country. By working with the Ontario Dental Association we were able to establish contracts between the provinces and the Canadian Dental Association and confirm the relationships between insurance networks and dentists.

The fact that so much time and effort was expended in Ontario is simply because Ontario is the largest component in the plan, and because of their size they have large resources to draw on. I don't think one moment of time spent with the Ontario Dental Association was wasted. All our efforts in Ontario will now benefit the other nine provinces. I am grateful for the cooperation extended by the entire ODA organization.

All our efforts in Ontario will now benefit the other nine provinces. I am grateful for the cooperation extended by the entire ODA organization.

Journal: Speaking of EDI and CDAnet, there has been open criticism that it leads to assignment. What do you say to these critics?

Dr. Les: A simple answer. CDAnet is strictly an electronic version of the paper form. There is no change in how the dentist operates the practice. It is absolutely up to the dentist whether assignment is a policy or not. Neither CDAnet, the insurance company, or the patient makes this decision. It is up to the individual dentist.

Journal: What about profiling?

Dr. Les: Profiling is certainly being done today by all the insurance companies. We would be naive to believe otherwise. Each insurance company has all the available data on the services provided for patients insured under their plans. CDAnet does not change this. There is no way that insurance companies will provide client information to one another. They regard this as very confidential data, whether its on paper or electronic claims.

Journal: One of your hardest working committees in recent years has been the committee on ethics, which has developed a new Code of Ethics. Was there something wrong with the previous code?

Dr. Les: Dr. Jim Brookfield and the committee on ethics have done an outstanding job. We have to accept the fact that changes go on in society continuously. Some things accepted 25 and 50 years ago don't really fit today. The new Code of Ethics established a current, modern, up-to-date framework on which dentists can base their conduct.

Perhaps this in an old man's thinking, but I believe economics may be a bigger factor today. I think influences upon dentists are greater today.

Journal: Dr. Harvey, can we ask you about the Code of Ethics? Do you think dentistry is as ethical or professional as it was 40 or 50 years ago?

Dr. Harvey: Perhaps this in an old man's thinking, but I believe economics may be a bigger factor today. I think influences upon dentists are greater today. Access to dental insurance provides far more opportunity for patients to have quality dentistry than ever before, but it also affords more possibilities and temptations for over-treatment.

Journal: Dr. Les, earlier your father was talking about the "one girl office," before certified dental assistants, receptionists and hygienists. Now we are facing a shortage of hygienists. Any comment?

Dr. Les: The demand for hygienists boggles the mind at times. It also has a strong influence on the salaries paid to hygienists in relation to, say, 10 years ago and to the salaries paid to other health care professionals. We are all greatly concerned. A hygienist is absolutely vital for a good preventive practice.

I think time will correct the supply problem.

Journal: We are grateful to both of you. This has been a unique opportunity to share your views on yesterday, today and tomorrow. Dr. Harvey, we wish you many more years of productive practice and Dr. Les, may your year as CDA president meet all the high goals and objectives you have set. Δ

Anesthesia and Patient Risk: The Debate Continues

E.R. Young, B.Sc., DDS, B.Sc.D., M.Sc., FADSA

The purpose of this article is not to debate the risks — or even the risks versus benefits — of general anesthesia. Instead, it is meant as a comment on the reference made in a recent article in *The Journal Of The Canadian Dental Association* in which the risk of a patient dying under general anesthesia was claimed to be about one in 10,000.¹ This figure is terribly misleading, particularly to the patient who may be undergoing anesthesia in a dental office.

The first discussions of patient risk during anesthesia date back to the days of chloroform anesthesia in the mid 1800s.² Many studies — primarily of a retrospective nature — have subsequently been undertaken to try and determine the actual risk(s) associated with anesthesia. However, using the words of A.S. Keats, "No control study of the hazards of operation without anesthesia or, conversely, anesthesia without operation will ever be performed. The hazards of anesthesia can never be considered independent of a second procedure."³

Similarly, there is no obvious reason to believe that anesthesia magically protects a patient from unexplained sudden death.

Of the many studies undertaken to determine patient risk during anesthesia, those of Lunn et al, conducted from 1972–1977 and published in 1982, which were further scrutinized, summarized and critiqued at length by Miller, probably remain the "gold standard" of such investigations.² These "Cardiff studies" were elaborately designed and adjudicated and included almost 110,000 anesthetics done for many forms of surgery (Table I).

TABLE I

Summary of the results of the Cardiff data of Lunn et al

Risk Factor	Incidents
(1) overall 6-day mortality after surgery	60 per 10,000
(2) overall deaths related at all to anesthesia	5 per 10,000
(3) anesthesia believed causative to death	0.8-0.9 per 10,000
(4) anesthesia partly or totally causative of death (includes 3 above)	1-2 per 10,000

A more recent study of 113,074 anesthetics showed that anesthesia played

a role in 13 cardiac arrests, or one in 7,500 anesthetics, and that six patients (one in 16,250 anesthetics) were not resuscitated.⁶

Similarly, several large, frequently-quoted retrospective studies, which involved patients with documented prior myocardial disease undergoing anesthesia and noncardiac surgery, have been reported.⁴ These studies suggested that:

- (1) adult patients without prior myocardial infarction (MI), have a 0.15-0.65 per cent risk of perioperative infarction;
- (2) patients with prior MI have an overall re-infarction rate of about six per cent;
- (3) patients with MI within three months prior to surgery have an approximate 30 per cent re-infarction rate;
- (4) patients with MI within three to six months prior to surgery have a 15 per cent re-infarction risk;
- (5) patients with MI six months or more prior to surgery have a five per cent re-infarction risk.

A more recent study by Rao et al⁵ has shown an improvement in perioperative risk for patients presenting with MI within three months prior to surgery to six per cent, for previous MI within three to six months to less than three per cent and for previous MI after six months to about one per cent. The study attributes this improvement in perioperative risk of MI to improved hemodynamic monitoring, and the aggressive use of beta blockers and vasodilators.

From these retrospective risk-benefit studies, several classifications of risk factors have been formulated — the most popular being the Goldman Risk Factor Index.⁷ Factors such as pre-existing medical status, extremes of age, urgency of surgery, type of surgery and duration of surgery all appear to contribute to increased risk. As well, the use of drugs which alter hemodynamic status, the use of endotracheal intubation (and extubation), and sheer exhaustion on the part of the operator, have also been shown to contribute to increased risk.²

These studies have lumped together data derived from many practitioners — perhaps with various levels of training and expertise — on a wide variety of surgical procedures and anesthetic techniques, and on patients with a wide range of pre-existing medical conditions. They frequently rely on

bias and memory, as well as anesthetic and surgical records that may or may not be accurate, data from monitors that may have been misinterpreted, and even data derived from a malfunctioning monitor. In other words, the data derived has limitations.⁸

The built-in danger of these studies is that their results can be incorrectly extrapolated to surgical procedures and anesthetics that were done in a manner completely different from the cases described in the studies and from which the conclusions of these studies were derived. For example, the results of the large retrospective studies on patients with documented MI undergoing anesthesia and surgery continue to be dogmatically extrapolated to similar patients undergoing routine dental treatment. This is nonsense.

Ambulatory surgery is rapidly becoming — and is being actively promoted as — an extremely popular option for a wide range of surgical procedures. Some of the reasons behind this move include cost efficiency, less disruption of family and personal life, less chance of hospital acquired infections and patient convenience.⁹ Initially, only ASA Classification I (healthy) patients were accepted for ambulatory surgery, but as the community at large has become more knowledgeable, supportive and enthusiastic of the concept, patients of virtually all ages and with various (albeit reasonably well-controlled) systemic diseases are being treated with more sophisticated anesthetic and surgical techniques. Although postoperative side effects are said to be relatively common, these are all invariably minor in nature (nausea, drowsiness, headache, myalgia), and are said to be, at least anecdotally, related to the female sex, lack of previous exposure to general anesthesia, intubation, the use of narcotics and/or nitrous oxide and an operating time of greater than 20 minutes.^{2,6,9,10} Surprisingly 65 per cent of those receiving local anesthetic techniques felt unfit to return to work or school the day after surgery as compared with only 28 per cent of the patients in the general anesthesia group.¹⁰

To date, the success rate of dental procedures performed on an outpatient basis in which deep-conscious sedation or general anesthetic techniques were utilized has given dentistry an admirable track record. Figures from the many reported surveys vary considerably, but they consistently

report in the order of less than one patient death for more than 500,000 anesthetics given.

Allen and Hayden discuss almost 400 worldwide cases of dental office anesthetic mishaps, many of which led to death, however.¹¹ The hazards emphasized include poor or absent preoperative patient evaluation, less than ideal or non-existent use of the patient's medical status, poor patient selection, gross lack of training by the operator, poor intraoperative and/or recovery room monitoring, and a bizarre selection of drugs, dosages and drug combinations. They quote the death rate from a simple local anesthetic injection as about one in 1,500,000, but, as with most such quotations, fail to mention how this figure was derived — from the medical status of the patient, by how much local anesthetic was given and by what route, or if epinephrine was used, etc, etc. This, of course, makes comparisons of general anesthesia to local anesthesia difficult, but Allen and Hayden's figure falls, nonetheless, in the accepted "ballpark" of figures often quoted.

In a similar fashion, the discussion of patient admissions to hospital following medical outpatient procedures cannot necessarily be extrapolated to dental outpatient procedures. In one such study, only lower abdominal procedures and procedures of greater than one hour in duration were significantly associated with the likelihood of hospital admission. Some of the other causes for admission were pain, bleeding and intractable emesis.¹⁰

Dental procedures accompanied by deep-conscious sedation or general anesthesia that are performed in dental offices by properly trained staff generally involve light anesthesia, utilizing drugs with minimal hemodynamic effects in relatively low doses, and avoid patient paralysis, intubation and extubation. They usually involve generally healthy or medically-optimized patients, and are generally of a fairly short duration. The operator, with a visible, non-draped patient, working directly in the airway, has first-hand access to the airway and, therefore, excellent monitoring ability.

To once again quote A.S. Keats, "To every benefit there is a risk. The only way to guarantee freedom from risk is to do nothing at all."³ When discussing and comparing risk, particularly with respect to anesthesia, we must keep all factors in perspective. Compare apples with apples, and not with oranges. Δ

Dr. Young is an assistant professor and the head of the department of anesthesia, faculty of dentistry, at the University of Toronto.

References

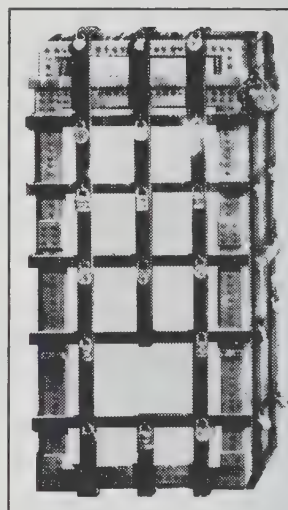
1. Crawford, P.R. CDA hosts HIV conference. *J Can Dent Assn* 57:481, 1991.
2. Miller, R.D., editor, *Anaesthetic risks. Anaesthesia*, Second Edition, Volume 1, 359, 1986.
3. Keats, A.S., What do we know about anesthetic mortality? *Anaesthesiology* 50:387, 1979.
4. Tarhan, S., Moffit, E.A., Taylor, W.F., Guillioni, E.R. Myocardial infarction after anaesthesia and surgery. *JAMA* 220:1451, 1972.
5. Rao, T.L., Jacobs, K.H., El Etr, A.A. Re-infarction following anaesthesia in patients with myocardial infarction. *Anaesthesiology*, 58:462, 1983.
6. White, P.F. Outpatient anaesthesia. *Anaesthesia*, Second Edition, R.D. Miller (ed), Volume 3, 1985, 1986.

7. Goldman, L., Caldera, D.L., Nussbaum, S.R. et al. Multifactorial index of cardiac risk in non-cardiac surgical procedures. *NEJM* 297:845, 1977.
8. Hardie, J. and Samaranayake, L.P. A critique of HIV transmission during dental treatment. *J Can Dent Assn* 57:487, 1991.
9. White, P.F. Outpatient anaesthesia for the adult patient. *ASA Refresher Course Manual*, New Orleans 232:1, 1989.
10. Gold, B.S., Kitz, D.S. Unanticipated admission to hospitals following ambulatory surgery. *JAMA* 262:3008, 1990.
11. Allen, G.D. and Hayden, J. *Complications Of Sedation And Anaesthesia In Dentistry*. Littleton, Mass., PSG Publishing Co. Inc. 1988.



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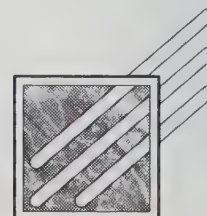
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Solving Your Scheduling Woes

Wrestling with Scheduling

If there is one factor that can make or break a practice, it is scheduling. Effective scheduling boosts staff morale, reduces stress and maximizes productivity. Best of all, it increases patient satisfaction by getting patients in and out of their appointments on time. And contrary to popular wisdom, tightening the scheduling noose does not diminish the quality of dentistry you provide. In fact, it is enhanced.

The key to tackling the seemingly insurmountable scheduling barrier is eliminating the guesswork that often plays havoc with appointment bookings. You must recognize that no two individuals are likely to make uniform appointment decisions, even if they work in the same office. Left to overly-optimistic doctors, appointments will be overbooked. Knowing this, assistants will underbook. And caught in between these opposing forces are the receptionists, who simply want to eliminate the blank spaces in the practice's appointment book. How can you control time (which *is* money) if decisions are not consistent?

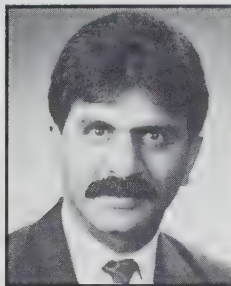
To start, you must adopt a scheduling strategy. Scheduling is the process of managing patient flow and maintaining productivity. An appointment's length must be determined by the amount of time actually needed to perform the procedure, not by a staff member's guess (no matter how educated that guess may be) as to how long the procedure will take. A balance needs to be struck; if you overbook, patient flow becomes unmanageable and if you underbook, productivity plummets. Adopting a scheduling strategy paves the way for establishing that balance, setting you at an even-paced tempo.

The goals of any scheduling strategy should be to:

- keep patients and doctors on time;
- ensure an efficient patient flow;
- maximize productivity by reducing slack time;
- utilize auxiliaries correctly.

Getting Started: Multiple Chair Booking

Multiple Chair Booking (MCB) is a scheduling strategy that maximizes the productivity of the practice *without* compromising patient care. In fact, for MCB to



Imtiaz Manji, B.Sc.
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be effective, patient needs must be fully considered. With MCB, scheduling is driven by these needs rather than by guesswork. And best of all, MCB offers the flexibility to successfully cope with all of the factors affecting production, everything from work speed to the number of operatories, assistants and hygienists to the daily realities of no-shows, cancellations, late patients, emergencies and interruptions.

Putting an MCB strategy to work in your practice can be done — painlessly. The first step is to recognize that every appointment follows the same pattern:

- preparing the operatory;
- seating the patient;
- administration and preparation for the procedure;
- completing the procedure;
- dismissal of the patient;
- cleaning the operatory.

Time and motion studies can furnish you with the information you need to effectively implement MCB. By identifying what needs to be done for each procedure (using the appointment pattern above as a starting point), how long it takes to complete each task and who is responsible for completing it, you'll be well on your way to making scheduling work for you instead of against you.

Time and motion studies will give you a breakdown on every procedure, specifying: assistant time (beginning of appointment); doctor time (during the appointment); assistant time (end of appointment).

For complicated procedures, you may want to break down the appointment even further, detailing more precisely how the doctor and assistant will alternate their time with the patient. This is often useful, as, although you can only be with one patient at a time, more than one patient can be handled in multiple operatories, with an assistant in each one. Patient appointments will thus overlap, but your time with them will not.

Once you have completed a time and motion study, you can design appointment profiles for every procedure you perform. To do this, you create codes for each procedure. For example, to represent the time the assistant spends with a patient you can use symbols such as parentheses, while your time with the patient can be designated by a code representing the procedure, be it "C" for crown or "N" for new patient visit. Thus, if a crown appointment takes two units of the assistant's time, three units of your time and then two more units of the assistant's time, the appointment profile would be ((CCC)), where each character represents a unit of time, preferably 10 minutes. (See chart for explanation of an MCB daysheet.)

Appointment profiles are invaluable in that they promote consistency in booking appointments, allowing each member of your staff to make appointment decisions. Furthermore, appointment profiles make it easy to document how scheduling is done in your practice, and for new staff to learn your scheduling techniques quickly and easily.

For multiple chair booking to be successful — without stress — interruptions (particularly phone calls) must be tightly controlled. Appointments are based on the exact amount of time required to complete a procedure, no more and no less. The MCB strategy keeps the clinical team working steadily on a schedule designed to maximize patient care and staff productivity. Interruptions disturb patient flow and can ultimately derail the scheduling process you worked so hard to get on track.

Making it Even Better: Ideal Day Scheduling

Once your team has mastered MCB, your practice should show a noticeable increase in productivity. The next step on the scheduling ladder is Ideal Day Scheduling (IDS). Its purpose is twofold — to enhance manageability and maintain productivity.

IDS is a scheduling system designed to take account of your personal work habits and preferences. Some dentists prefer to handle lengthy procedures — such as crown and bridge work — in the morning, when they feel sharpest. Others dread this thought, preferring to do their most arduous treatments in the afternoon. Whatever the case, IDS allows you to schedule

appointments based on your preferences with no loss of productivity.

“Interruptions disturb patient flow and can ultimately derail the scheduling process you worked so hard to get on track.”

To make the leap from MCB to IDS you must understand the appointment needs of your patients. While MCB forces you to understand exactly what is involved in terms of both staff and time for each

appointment type, IDS forces you to understand what mix of appointment types are necessary to meet your patients’ treatment needs.

For example, practices that boast high patient flows often have a difficult time scheduling appointments for new patients. Because the schedule is already very full with appointments for existing patients, new patients must often wait weeks for their first visit.

Why not set aside time in the weekly schedule specifically for new patients? To do this, you obviously need to have an estimate of how many new patients you typi-

cally see each week. Similarly, if you know how many crowns and bridges you typically perform, set aside time for them. While you are doing this, you can choose when you want crowns and bridges scheduled (ie. morning or afternoon).

Before launching IDS, you must analyze your patient base and practice history to capture the right mix of appointments in the schedule. Setting aside too much time for new patients will reduce productivity due to unfilled appointments. Setting aside too little time will either cause patients to wait too long for their first visit or force you to accept new patient appointments during times when you would rather be performing other procedures.

The goal of IDS is to create a template (if you’re using a computer for scheduling, which I strongly recommend) or a guide (if you’re using a manual appointment book). IDS lets you block out time for the various procedures that are important to your practice. To maintain productivity and be effective, the template or guide must have the right mix of appointments and must allow for flexibility. Sometimes you will have to accept appointments during times when you’d rather not. Sometimes emergencies will arise. These situations are inevitable, but a well-designed template or guide minimizes the disruption they cause, allowing your team to compensate and easily deal with the situation.

IDS can also reduce stress in the practice. By continually monitoring problems in the schedule, the team can adjust the scheduling template or guide to minimize future problems. Patient flow can be controlled effectively and productively.

The Final Step: Communication

While the secrets to successful scheduling lie in MCB and IDS, these strategies, on their own, will not result in a happy practice. Communication – both with your staff and patients – is the key to achieving this goal. Undoubtedly, problems and emergencies will arise on occasion, but armed with MCB and IDS as well as an open communication policy, you and your staff will have the weaponry needed to win the scheduling battle.



TWO CHAIRS Friday AM, Sept 6			
TIME	SUM.	OPERATORY 1	OPERATORY 2
8:00		(Smith, John 4 (15 DO) do IPA	
8:10		A	
8:20		A	(Lake, Charles 4 (DO1) 11m 47 IHM
8:30		)	F
8:40		(Ling, Angela 4 (DO1) 36 pulp IHM	F
8:50		E	)
9:00		E	
9:10		)	
9:20		(Smith, Mary 6 (DO1) New Pa IHM	(King, Margaret 3 (DO1) ext 18 IH
9:30		)	X
9:40		N	)
9:50		N	(Bosse, Ray 5 (DO1) 36 ob 11 IAP
10:00		)	E
10:10		)	E
10:20		(Van Barlo, Lynne 3 (DO1) 11m	E
10:30		X	)
10:40		)	(Peace, Wayne 4 (DO1) Emerg UL
10:50		(McKaugh-dore Na 7 (DO1) Crown	(
11:00		C	)
11:10		C	)
11:20		C	
11:30		C	(Bosse, Nancy 4 (DO1) 24do IAD
11:40		)	W
11:50		)	W
12:00			)

- A = Amalgam

E = Endo

N = New Patient Visit

X = Extraction

C = Crown

F = Filling
- W = White Filling

= Doctor Time Op. 1

= Doctor Time Op. 2

(= Assistant Begins

) = Assistant Ends

TECHNOLOGY



Computerized scheduling offers many advantages to the dental practice, the most important being the introduction of "multiple" appointment books. With terminals located throughout the practice, the appointment book is at everyone's fingertips. An auxiliary in the back of the office can reschedule a patient's appointment as easily as the receptionist can.

Computerized scheduling is great for producing to-do lists. At the touch of a button, you can generate a printed or on-line list that shows every patient who needs to be contacted about an upcoming appointment or for any other reason. And taking inventory of future appointments, cancellations and no-shows — for the practice as a whole or on a per patient basis — is a cinch.

By using terminals to allow everyone on the dental team access to the schedule, the roles of the assistants and the hygienists can be expanded to include duties normally handled at the front desk. The bulk of appointment scheduling for existing patients can be completed by the auxiliary while the patient is in the chair. As a result, the practice is decentralized and the recep-

tionist only has to worry about collecting payment when dismissing the patient. The demand on the receptionist's time is reduced, allowing her the opportunity to fill in open times in the schedule. Slippage is reduced dramatically.

Computers allow you to formalize scheduling so that it becomes less of an art (under the control of a single individual) and more of a science (under the control of the entire team).

Manual Appointment Book vs. Computerized Scheduler

	Apt. book	Computer
1) Usability	Easy	Easy
2) Speed on booking	Fast	Faster
3) Cancellations/ No-shows	Slow and lost patients.	Fast filled. List remains alive
4) Searching for open time	Slow	Fast
5) MCB and IDS	Workable and chaotic.	Easy and efficient
6) Multiple Producers	May require more books.	Fully flexible
7) Day sheet	Illegible	Easy to read
8) Display of appointments	Fixed	Variable
9) Potential appointments (Inventory)	Not available	On line
10) Movement	Easy	Excellent
11) Close-up of retention history, hygiene & planned treatments	Easy	Excellent
12) Detail of clinical treatment history and demographics	Not available.	Excellent
13) Charts	Always needed	Occasionally needed
14) Appointment tracking	Time-consuming page flipping	Easy access



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Treatment of the ankylosed mandibular permanent first molar: A case study

Glenn Paleczny, B.Sc., DDS
North Bay, Ontario

Introduction

Tooth ankylosis is a problem that is sometimes encountered in tooth development and eruption. Ankylosed teeth may contribute significantly toward the creation of both malocclusions and periodontal defects, which makes the early diagnosis and treatment of this condition imperative. It can occur at any stage in the development of a tooth after root formation has taken place. In the permanent dentition, the teeth most often affected are the first molars, whereas in the primary dentition it is usually the mandibular first primary molars that are affected. Ankylosed areas of a tooth can be localized or can involve the entire root surface resulting in a loss of periodontal membrane. Ankylosis is believed to result when the periodontal ligament fails to continue to separate cementum and dentin from bone.² When this failure occurs, cementum and dentin may be resorbed and replaced by bone, resulting in fusion of the tooth to the alveolar bone.

The case presented in this paper involves the treatment of an impacted lower first molar that was found to be ankylosed. The nature of the ankylosis was designated as localized and idiopathic in origin. Through surgical exposure and by luxating the tooth in a manner that overcame the ankylosis, the involved tooth was allowed to erupt into occlusion and assume a normal position and function in the dental arch.

Case Review

A nine-year-old male patient was seen at the dental office for a routine dental examination. The patient was in good oral and physical health with an unremarkable medical history. Clinical observation revealed the following. The lower right first molar had failed to erupt whereas the lower left first molar had erupted fully into occlusion. The patient was in the mixed dentition stage of development. It was noteworthy that the maxillary right first molar had not over-erupted at this time. There was no history of trauma to any part of the maxillary or mandibular jaws. Radiographs, specifically the panoramic and periapical

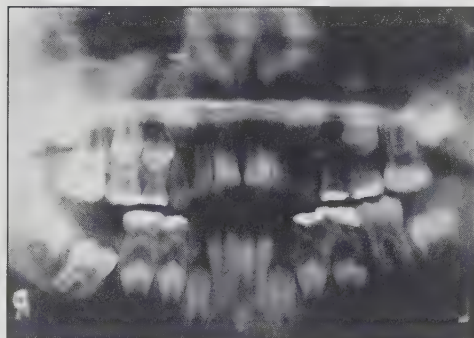


Fig. 1a Pretreatment panoramic radiograph.



Fig. 1b A closer view of the same radiograph.

views, revealed the existence of the impacted lower right first molar. They also showed the tooth to be in good position. The only deviations from normal seen on the radiographs were that the roots of the impacted lower molar were not fully formed and the mesial root was slightly dilacerated.

Treatment

Initial treatment of the unerupted lower first molar was directed at eliminating all possible obstructions in the eruptive path of the tooth. It was thought that, with all obstructions out of the way, the impacted molar would be free to erupt into position if it was not ankylosed. The prominent distal root of the adjacent primary second molar was considered to be a probable obstruction, as was the considerable amount of alveolar bone overlying the impacted tooth. Initially, a conservative procedure that consisted of extracting tooth 85, as well as surgically removing a window of bone covering the lower first molar, was performed. It was hoped that

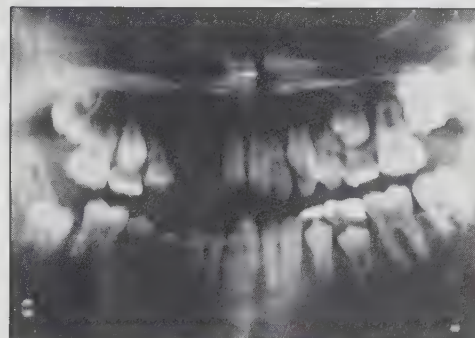


Fig. 2a Posttreatment panoramic radiograph. Note the change in position of the lower right first molar following luxation.

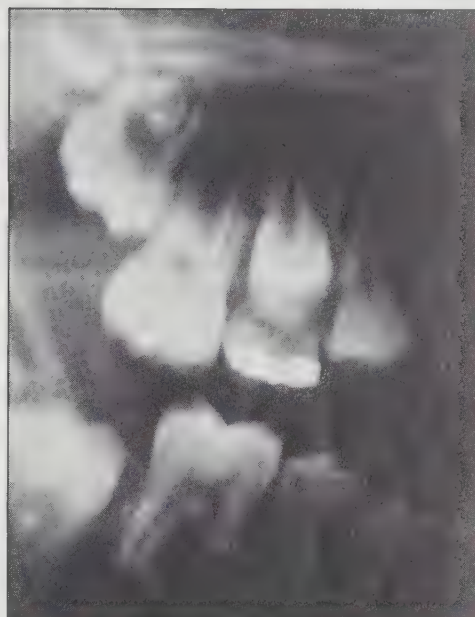


Fig. 2b A closer view of the same radiograph.

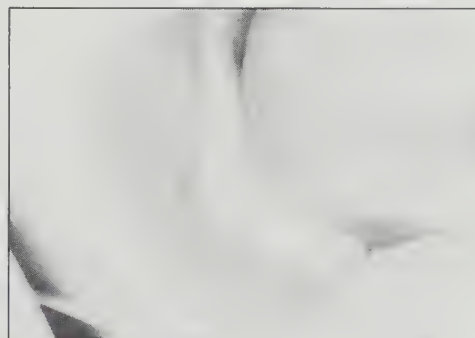


Fig. 3 Posttreatment right side view of the lower right first molar showing eruption of the tooth into a more normal position.

this would permit the tooth to erupt naturally into occlusion.

After the initial phase of treatment, the patient was seen at two-month intervals to monitor the eruption of the molar. After six months, no clinical or radiographical changes were observed. Evidently, the primary molar (85) and the large amount of overlying bone had not obstructed the eruption of the lower first molar. Therefore, ankylosis along the root surface(s) of the impacted molar was thought to be the most probable cause for the failure of the tooth to erupt.

At this point a second procedure was performed. The lower first molar was surgically exposed and luxated in a manner described by Hemley. The tooth was gently rocked in all directions (buccal, lingual, mesial, distal). Once again, the patient was observed on a recall basis and within nine weeks the tooth had erupted into the oral cavity. Full occlusion was achieved within four months, and the right molars had achieved good occlusal contacts.

Discussion

The etiology of ankylosis is unknown at this time. It is apparent that some defect, failure, or alteration of the periodontal ligament must precede ankylosis as no ankylosis will occur in teeth with normal periodontal ligaments.³ It has been suggested that this condition is due to: a) genetic origin; b) a congenital gap in the periodontal membrane; c) localized trauma; or d) locally disturbed metabolism.⁴

The dental literature reveals the following characteristics with respect to ankylosed teeth. The incidence of ankylosis of one or more primary teeth in children varies between 1.5 and 9.9 per cent, depending on the study cited.⁵ Differences in age, ethnic background and the criteria used for the diagnosis apparently account for the wide discrepancy observed in these studies. As an example, Caucasians and Hispanics have a higher incidence of ankylosis than do black and Oriental groups. The ratio of occurrence in primary versus permanent teeth has been reported at 10-1.⁴ The primary tooth that is most frequently ankylosed is the lower first molar, whereas in the permanent dentition the first molar is most frequently affected.¹ Mandibular teeth tend to ankylose twice as often as maxillary teeth and the condition is frequently observed bilaterally.⁴ There appears to be no relationship to sex, family, caries involvement, systemic disease, occlusal stress or gingivitis.⁵ It is interesting to note that some researchers have supported trauma as an etiological factor,^{6,7} while others have disputed its inclusion as a contributing cause.⁸

However, attempts to produce ankylosis by trauma have not yielded any evidence that this cause is important in the etiology of the condition.⁹

In an attempt to determine which areas of the tooth were affected by ankylosis, Raghoobar et al⁵ conducted a histological study involving ankylosed and non-ankylosed permanent molars. In over 80 per cent of the cases, the areas of ankylosis were located at the bifurcation and interradicular root surface.

Diagnosis of ankylosis may involve one or more of the following criteria:



- a) Failure of a tooth to erupt and/or reach its normal occlusal level. The tooth may appear to be submerged. At one time the affected tooth may have been in occlusal contact with the opposing arch, but after it becomes ankylosed the adjacent teeth, along with the alveolar bone, develop and grow past it.³
- b) A characteristic clinking or ringing sound produced by ankylosed teeth while performing percussion tests.¹⁰
- c) Radiographs displaying an area with loss of periodontal membrane.¹¹
- d) Ankylosed teeth are very difficult to mobilize when 10 per cent to 20 per cent of the root has become ankylosed. They become immobile when over 20 per cent of the root is involved.¹²

Infraocclusion is the most important and reliable clinical criterion, while radiographs are the least useful device for the detection of ankylosis. A radiograph will show a very limited aspect of the periodontal ligament, since it represents a three-dimensional object projected onto a two-dimensional surface. Furthermore, with multi-rooted teeth, overlapping structures may make it impossible to see small areas of ankylosis using radiographs.¹² In general, percussion tests have been found to be more reliable in revealing ankylosis than radiographs.^{6,13} In a study by Anderson et al¹² it was shown that a solid percussion sound can be recorded if over 20 per cent of the root is ankylotic.

It should be noted that the diagnostic methods of evaluating percussion tests and interpreting radiographs are qualitative interpretations that are dependent mostly on the individual conducting the tests. Additionally, many false negative outcomes are arrived at from these diagnostic tests simply because they depend on the extent of the ankylotic area. For these reasons, a positive clinical test is strongly suggestive of ankylosis, but in the case of a negative test, ankylosis should not be excluded.

Dental problems arising from ankylosed teeth that remain unerupted or submerged may include:

- a) Initiation of occlusal and periodontal problems for adjacent and opposing teeth.¹¹
- b) Loss of proximal contact, with eventual tipping of the adjacent teeth into abnormal inclinations.
- c) Loss of occlusal contact permitting over-eruption of opposing teeth.

Teeth which are ankylosed can create marked abnormalities in the occlusion because they do not properly contribute to the growth and development of the jaws and dentition. Occlusal disharmony, food impaction and subsequent restorative problems are often associated with teeth affected by ankylosis. Most practitioners are well aware of the pitfalls that periodontally compromised, tipped, and over- and under-erupted teeth can present. For these reasons, the treatment of ankylosis is directed toward the prevention of malocclusion and periodontal defects.¹¹ Successful treatment depends on early diagnosis. Treatment that has been delayed should aim to reestablish proper occlusion and periodontal health. Albers¹¹ gives three treatment options for an ankylosed tooth that remains submerged:

a) Prosthetic build-up

When ankylosis occurs relatively late in the development of a tooth, and the tooth lies just below the occlusal plane, the occlusion and interproximal contact can be restored by means of a crown. This is usually considered a provisional treatment at best since tooth eruption and bony apposition continue as an ongoing process. Given time, the alveolar bone will usually become deficient and the periodontal condition of the adjacent teeth will generally deteriorate as a result. Most primary teeth affected by ankylosis are lost in this manner, despite our best efforts to retain them.

b) Extraction and space maintenance

If a primary molar is ankylosed and there is going to be an obvious malocclusion and inadequate alveolar bone height, early

extraction of the affected tooth and space maintenance should be considered.

In the case of anterior permanent teeth, extractions should only be performed after attempts at luxating the tooth have failed. When a permanent first molar is ankylosed, extraction of the involved tooth will allow the second molar to drift mesially and erupt into a position that would normally be occupied by the first molar. However, the timing of the extraction is essential and success will be increased if the procedure is done before root development has occurred on the second molar. If this mode of treatment is attempted later, when root development of the second permanent molar has commenced, orthodontic procedures may be required to align the mesially tipped second molar.¹

Extractions are also indicated with ankylosed teeth that are malpositioned, severely periodontally compromised or extensively decayed, rendering the tooth unrestorable. Conversely, if the tooth is favorably aligned and enough space is available for eruption to occur, it is far better to delay the extraction and draw upon the eruptive potential of the tooth after luxating it.

c) Luxation

Luxation can be an effective method of treating ankylosed teeth, and has the advantage of being very simple. The tooth is anesthetized and then gently mobilized using a pair of surgical forceps. The idea behind luxating the tooth is to disrupt the area(s) of ankylosis in the periodontal ligament while maintaining the periapical blood supply. The subsequent inflammatory reaction may result in the formation of a new fibrous ligament in the ankylosed area(s) of the affected tooth. By using surgical forceps to break the ankylosis, the tooth is often freed sufficiently to allow further eruption.

When the tooth is actually luxated, it should be mobilized slowly and gently to prevent any disruption to the periapical blood supply. Hemley¹⁴ suggests a technique of surgical forceps luxation in which the tooth is moved buccal-lingually with forceps and anteroposteriorly with an elevator. Attempts to rotate the tooth may compromise the blood supply.¹¹

It is essential that the patient (and parent) be advised prior to the procedure that luxation does not always produce the desired result. Possible undesirable outcomes following luxation include:

- a) no change in position of the tooth;
- b) the need for endodontic therapy;
- c) root fracture; and
- d) loss of the tooth.

If the tooth does not respond within six months, it can be luxated again.¹¹ Fur-

thermore, if the crown of the tooth is readily accessible, relaxation accompanied by the placement of orthodontic wires to assist eruption may also be a consideration. Orthodontics may also be required to obtain proper positioning of the tooth in the arch. These possibilities should be brought to the patient's attention so that informed consent may be obtained before treatment occurs.

From the standpoint of the patient and practitioner, this treatment alternative is usually the most desirable. The drawback of this method is the lack of predictability in its outcome. It has been shown to be a successful method of treatment for ankylosed teeth, but only by individual case studies.¹⁴⁻¹⁷ The dental literature does not show any research whereby this method has been scientifically studied and evaluated to show its reliability. Biederman suggests that luxation, if done properly, can relieve ankylosis 70 per cent of the time if the tooth is not locked into position by other teeth. Moyers, on the other hand, cautions that routine success is not to be expected, even with orthodontic treatment as a follow up.

Summary

The treatment of ankylosed teeth has been reported. While the diagnosis of the condition can be readily made, the etiology remains unknown. Treatment of these teeth is aimed at preventing malocclusions and periodontal defects from developing. Once diagnosed, these teeth require careful evaluation and prompt treatment. Delaying treatment nearly always results in a less favorable outcome.

In the case presented, it was thought best to attempt luxation rather than to extract the mandibular first molar to overcome the ankylosis. This reasoning was based on the fact that there was adequate space for the first molar to erupt into and the maxillary first molar had not over-erupted. Selection of the best mode of treatment will depend upon many factors, including space available for the eruption of the involved tooth, inclination of the tooth, stage of development of the dental arches and overall health of the involved tooth. Δ

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References

1. Moyers, R.E. *Handbook of Orthodontics*. Ed. 4. Chicago, Illinois, Year Book Medical Publishers Inc.,

pp. 107-108 and 388-391, 1988.

2. Krakowiack, F. Ankylosed primary molars. *J Dent Child* 45:288-292, 1972.

3. Raghoebbar, G.M., Boering, G., Jansen, H.W.B. et al. Secondary retention of permanent molars: a histological study. *J Oral Path Med* 18:427-431, 1989.

4. Biederman, W. Etiology and treatment of tooth ankylosis. *Am J Orthodont* 48:670-684, 1962.

5. Thornton, M. and Zimmerman, E.R. Ankylosis of primary teeth. *J Dent Child* 31:120-126, 1964.

6. Andraesen, J.O. *Traumatic Injuries of the Teeth*. Ed. 2. Copenhagen, Munksgaard, pp. 211-218, 1981.

7. Brearly, L.J. and McKibben, D.H. Ankylosis of primary teeth. I. Prevalence and characteristics. *J Dent Child* 40:54-63, 1973.

8. Kurol, J. Infraocclusion of primary molars: An epidemiologic and familial study. *Comm Dent Oral Epidemiol* 9:94-102, 1981.

9. Rubin, L. and Biederman, W. Attempt to produce tooth ankylosis. *J Dent Res* 40:144, 1961.

10. Konstat, M. and White, G. Ankylosed teeth: A review of the literature. *J Mass Dent Soc* 24:74-78, 1975.

11. Albers, D.D. Ankylosis of teeth in the developing dentition. *Quint Intnl* 17:303-308, 1986.

12. Andersson, L., Blomlof, L., Lindskog, S. et al. Tooth ankylosis. Clinical, radiographic and histological assessments. *Int J Oral Surg* 13:423-431, 1984.

13. Andraesen, J.O. Periodontal healing after replantation of traumatically avulsed human teeth. Assessment by mobility testing and radiography. *Acta Odont Scand* 33:325-355, 1975.

14. Hemley, S. *A Text on Orthodontics*. Coiner Publications Ltd., pp. 421-434, 1971.

15. Biederman, W. A.J. *Orthodontics*, 48:670-680, 1962.

16. Rubin, P.L. and Bisk, F. Ankylosis of a lower first molar. *NYS Dent J* 53:32-36, 1987.

17. Newton, W. The problem of molar ankylosis. *J Mo Dent Assoc* 37:7-12, 1957.

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that a miracle had happened. The pebbles had been transformed into diamonds, rubies and other precious stones. They remembered the warning and they were indeed both glad and sorry. Glad they had taken some, sorry they had not taken more. And this is the story of insurance.

Author unknown

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The surgical management of maxillofacial pathology

William L. Frydman, DDS, F.R.C.D.(C), Dip., ABOMS

Introduction

Maxillofacial pathology presents a unique challenge to the ablative and reconstructive surgeon. This stems from the critical esthetics and anatomical complexity of this region as well as the bodily functions that are directly linked to it. These include vision, ventilation, mastication, facial expression, speech and deglutition.

Attempts to definitively treat extensive benign or malignant lesions occurring in the maxillofacial area are often hindered by poor anatomic access and the fear of creating debilitating functional deficits. Furthermore, since most odontogenic lesions are found in patients between 20 and 40 years of age, the final surgical result must provide optimum long-term function, esthetics and the opportunity for dental rehabilitation. Fortunately, major advances in diagnostic imaging, bone grafting, soft tissue flap techniques and microsurgery are greatly improving the ability of the oral and maxillofacial surgeon to functionally and esthetically reconstruct the oncology patient. The goal of this paper is to demonstrate a logical and systematic treatment approach for extensive maxillofacial lesions through the use of advanced diagnostic imaging and oncologic surgical techniques.

A comprehensive and organized approach to the management of extensive maxillofacial lesions will assure a definitive cure and optimize the reconstructive result. The first step involves the collection of information. The medical history of the patient, physical examination, conventional radiographs, advanced imagery and incisional biopsy collectively contribute to the fulfilment of this goal.

History: A thorough evaluation of the patient's medical and surgical history can identify conditions that may alter or limit the surgical plan. Cardiac and respiratory disorders may limit the length of general anesthesia, while diabetes may result in poor healing and an increased susceptibility to infection. Systemic bone diseases such as osteoporosis and osteomalacia, as well as drug induced endocrinopathies and nutritional disorders, may compromise bone graft consolidation. It is, therefore, absolutely necessary to perform a compre-



Figure 1A. Axial CT scan with iodinated intravenous contrast medium at level of maxillary alveolus: (1) hard palate; (2) ramus of mandible; (3) masseter muscle; (4) medial pterygoid muscle; (5) lateral pterygoid plate; (6) maxillary dentition.

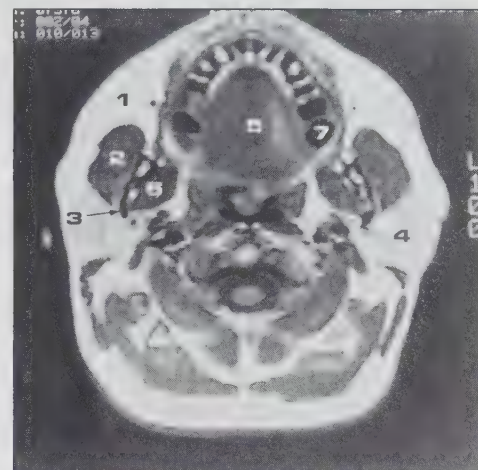


Figure 1B. Axial T1 weighted MRI at level of maxillary alveolus: (1) subcutaneous fat (high intensity); (2) masseter muscle (medium intensity); (3) cortical bone of ramus (low intensity); (4) parotid gland (medium to high intensity); (5) hard palate; (6) medial pterygoid muscle; (7) maxillary second molar root.

hensive review before planning a definitive treatment strategy.

Physical Examination: A thorough head and neck examination will detect: (a) regional lymphatic metastases; (b) regional soft tissue extension, osseous perforations and oral mucosal involvement; (c) masticatory muscle involvement (trismus); (d) regional sensory and motor nerve deficits (cranial nerves V2, V3, VII, XII); (e) airway compromise; and (f) recent changes in occlusion.

Conventional Radiography: The information obtained from conventional radiographic techniques is generally limited to osseous structures. Radiographs are invaluable, however, for detecting lesions at their early stages and for obtaining an initial impression of whether a lesion is cystic, benign or malignant.

Advanced Diagnostic Imaging: In 1972, computer-based tomographic (CT) scanning technology was introduced. This revolutionary technique provided sharp and detailed images of both hard and soft tissue.¹ The ability to differentiate between tissues is dependent upon variations in electron density. Normal and abnormal tissues of similar electron density may be indistinguishable, even when

an iodinated contrast medium is used. Unfortunately, because soft tissue margin can be limited, the usefulness of CT scanning in determining the precise degree to which a soft tissue tumor has extended can be compromised. Despite these drawbacks, images of bone and soft tissue obtained with CT scanning possess a clarity and sharpness that make them vastly superior to similar images obtained with conventional and standard tomographic radiography (Fig. 1A).

Magnetic resonance imaging (MRI) provides optimum soft tissue contrast in all planes (axial, coronal, sagittal and oblique) without ionizing radiation. This technique involves the magnetization and alignment of spinning protons (hydrogen nuclei) through the application of long (180 degree) and short (90 degree) external radiofrequency pulses.² The return of excited protons to their original equilibrium state produces a current in the receiver coil, which is eventually translated into a computer-generated image. By varying the time and frequency of magnetic pulsations, different images are obtained which indicate the proton composition of the tissue.²

These computer-generated images contain regions of high (light), medium (grey) and low (dark) signal intensity (Fig. 1B). Since the molecular composition of a tumor

or cyst is generally different from the surrounding tissue, a magnetic resonance image can detect and precisely delineate the extent of a lesion in both hard and soft tissue.³ When compared with CT scanning, MRI generally provides improved lesion detectability, edge definition, and assessment of regional lesion extension.⁴ In fact, Gradient Refocusing Acquisition in the Steady State (GRASS) images can differentiate between high- and low-flow vascular lesions.³

Since MRI is extremely sensitive to tissue and fluid composition, it is essential to obtain this scan prior to conducting a biopsy procedure. The surgical inflammatory response generated by a biopsy could alter the images obtained, making it difficult to determine whether the unique signal intensity of a given region is reactive or neoplastic.

In summary, advanced imaging can contribute to the diagnostic and surgical planning process in the following manner: (a) detection of lesions by MRI that are undetectable by other techniques;⁴ (b) accurate tumor delineation and determination of the extent of tissue plane involvement;⁴ (c) lymph node assessment; (d) tumor versus cyst, and benign versus malignant differentiation; (e) acquisition of representative specimens with MRI-guided biopsies; (f) detection of soft tissue tumor recurrence by MRI.⁵

Biopsy: It must be emphasized that the biopsy procedure must follow the MRI scan, which may indicate regions of bone perforation and soft tissue invasion. Whenever possible, however, a biopsy should be performed to histologically confirm the MRI impression. This information is absolutely crucial in planning the surgical approach. Nevertheless, if the MRI describes a vascular lesion such as a central hemangioma or arteriovenous malformation, aspiration is indicated and a biopsy is not advised.

The information obtained from the clinical examination, the MRI or CT scans and the biopsy will help delineate how far the tumor has spread, prevent the unnecessary resection of uninvolved tissue and ensure the resection of all contaminated areas. It is imperative to formulate a reconstructive surgical plan prior to ablative tumor surgery in order to facilitate an optimum result. A one-stage approach indicates simultaneous ablative and immediate osseous reconstructive surgery. A two-stage approach indicates extirpative surgery followed by osseous reconstructive surgery four to 12 months later.

The surgical approaches to extensive odontogenic tumors and cysts are based on the histopathology, how far the tumor

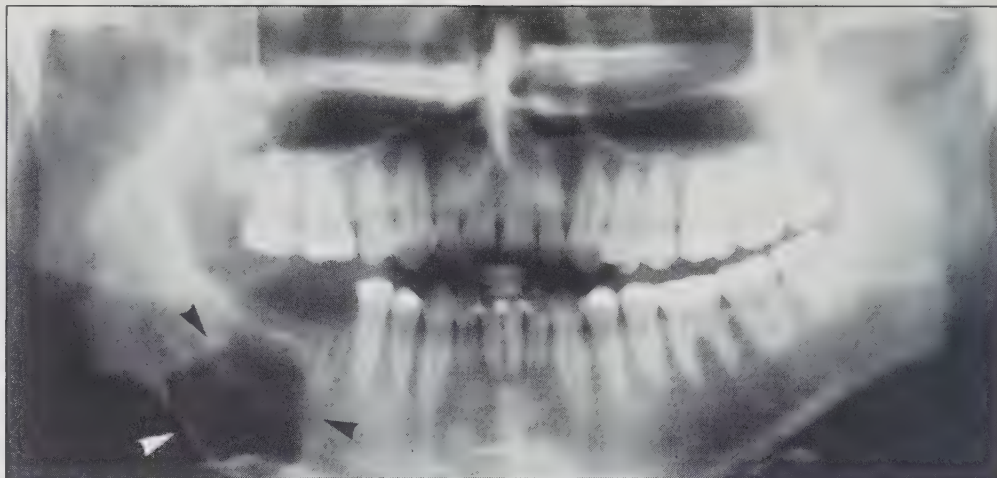


Figure 2 (Case 1): A 28-year-old male presented with an extensive ossifying fibroma. A panoramic radiograph exhibits a moderately well delineated unilocular radiolucency of the mandible that involved teeth 46 and 47 (black arrows). Note involvement of inferior border (white arrow). The teeth have been extracted and the oral mucosa has been primarily closed in order to facilitate a one-stage treatment plan.

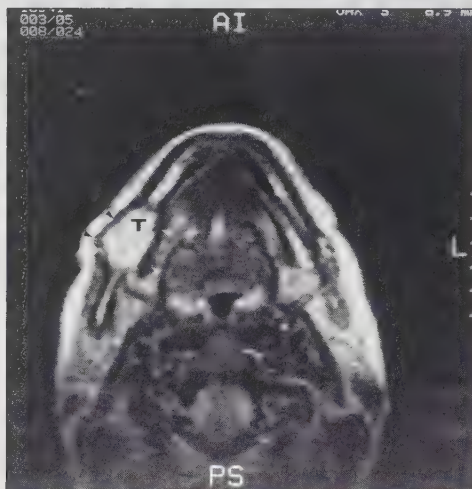


Figure 3 (Case 1): MRI – Axial T2 weighted image. A relatively homogeneous high signal intensity lesion (T) involving both medial and lateral cortices, the inferior border, and roots of teeth 46 and 47. Cortical expansion is noted (arrows) while soft tissue invasion is not a feature. Note accurate tumor delineation and differentiation from adjacent bone. A histologic diagnosis of ossifying fibroma was made after the MRI was performed.

has spread, the extent of soft tissue invasion, oral/dental involvement, and the need for reconstructive surgery. These lesions can be divided into four broad categories: (1) Lesions limited to bone with (a) dental involvement; or (b) no dental involvement; (2) Osseous lesions involving oral mucosa; (3) Osseous lesions invading beyond the periosteum into soft tissue (oral mucosa not involved); (4) Osseous lesions invading oral mucosa, fascia, muscle, adjacent glands and nodes.

1(a). Lesions With Dental Involvement

These lesions directly involve the roots of the teeth, which necessitates their removal. When the required ablative sur-



Figure 4 (Case 1): Three months post extraction, one-stage surgery is performed. a. Tumor en bloc resection via subperiosteal approach, oral cavity is not involved; b. Immediate osseous reconstruction; c. Immediate inferior alveolar nerve microneurosurgical repair. Note extensive cortical expansion.

gery results in either discontinuity or significant weakening of the jaw, reconstructive bone grafting is indicated. One option involves the extraction of all teeth associated with the lesion. This procedure should be performed two to four months prior to definitive ablative surgery in order to obtain primary oral closure. Tumor resection is then completed using an extra-oral approach and a subperiosteal dissection. The primary oral closure now permits an en bloc resection, free of oral cavity contamination, which facilitates immediate bone grafting in a sterile field. A transoral approach should be avoided if immediate osseous reconstruction is contemplated. (Case 1, **figs. 2-4**. A 28-year-old male presented with a slow growing expansile lesion of the right mandibular body. Diagnosis: ossifying fibroma)

1(b). Lesions With No Dental Involvement

Lesions in this category are located proximally or inferiorly in the mandible at an

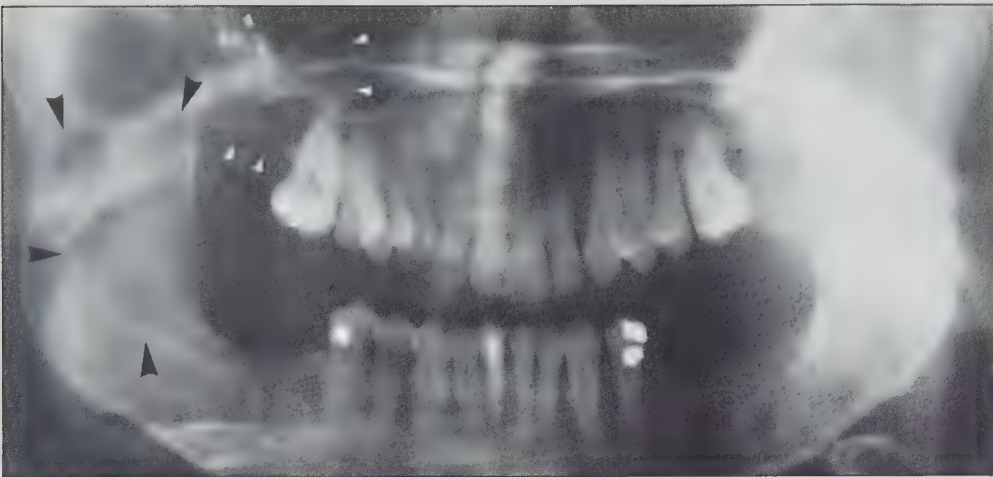


Figure 5 (Case 2): A 33-year-old male with basal cell nevus syndrome presented with an extensive recurrence 10 years postoperatively. Panoramic radiograph revealing a large multilocular radiolucency of the right mandibular ramus and angle (black arrows). Note that the condylar head does not appear to be involved. Also note the unilocular lesion in the right maxillary tuberosity (white arrows).

adequate distance from the dentition. This precludes the need for preparatory extractions and primary oral closure. A one-stage surgical approach with a subperiosteal dissection can be used to remove the lesion and to immediately provide osseous reconstruction. A transoral approach may be used with small lesions that do not require bone grafting.

2. Osseous Lesions Involving Oral Mucosa

Lesions that invade beyond bone necessitate the removal of the overlying oral mucosa in conjunction with the underlying bone. Every attempt should be made to avoid exposing the tumor by always taking an appropriate margin of the bone and soft tissue surrounding it. This approach necessitates a two-stage approach and a buccal or tongue flap may be required in order to close the oral defect. Should the ablative surgery result in a mandibular discontinuity defect, intermediate stabilization can be obtained by using a rigid reconstruction plate.⁶

3. Osseous Lesions Invading Beyond Periosteum Into Adjacent Muscle Or Fascia

Lesions in this category can be treated similarly to those in category 1(b), although a suprapariosteal dissection approach is required. Again, a surgical oncologic technique is used, which involves the resection of the contaminated periosteum, fascia, and muscle in an bloc approach.⁷ The preservation of a sterile field permits a one-stage approach with immediate osseous reconstruction (Case 2, **figs. 5-7**). A 33-year-old male with basal cell nevus syndrome presented with recurrent mandibular and maxillary keratocysts).

4. Osseous Lesions Invading Oral Mucosa, Fascia, Muscle and Gland

Lesions in this category are generally long-standing, extensive tumors that require a two-stage approach. A complete or partial hemimandibulectomy in conjunction with broad oral mucosa, fascia, and muscle resection is often necessary. Every effort should be made to preserve the articulation of the temporomandibular joint in order to optimize mandibular function after reconstruction. Because the submandibular space is invaded, either a complete or partial suprahyoid neck dissection is required. Again, the tumor should not be visible at any time during the dissection. Depending on the location of the tumor, the suprahyoid neck dissection can include an en bloc removal of the submandibular gland, lymph nodes, superficial fascia, anterior and posterior bellies of digastric muscle, and the mylohyoid muscle.⁷ Immediate temporary reconstruction with a rigid reconstruction plate and cervical muscle flaps ensures proximal and distal fragment alignment until the delayed second-stage osseous reconstruction can be performed. The cervical muscle flaps provide soft tissue support and a vascular supply for the future bone graft. (Case 3, **figs. 8-13**. A 26-year-old male presented with right facial swelling, buccal cortical expansion, medial mandibular loss of cortex and fluctuance from tooth 42 to the retromolar region. Diagnosis: Ameloblastoma.)

Discussion

The goals of maxillofacial tumor surgery should be to: (a) minimize the chances of lesion recurrence; (b) minimize functional and sensory deficits; (c) facilitate immediate or delayed reconstruction; (d) provide

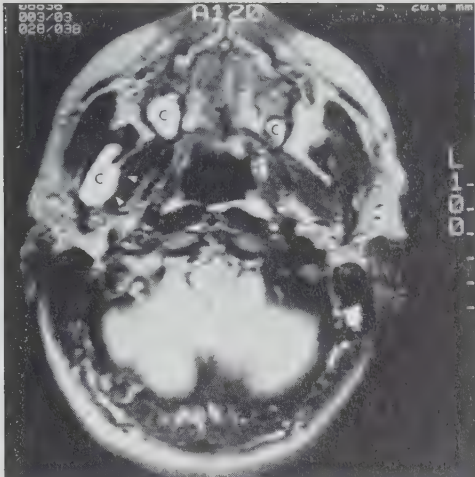


Figure 6 (Case 2): MRI — Axial T1 weighted image. A well-circumscribed high intensity homogeneous lesion is noted in the right mandibular ramus as well as bilateral lesions in the maxillary tuberosity (C). Note the medial cortical perforation and the medial pterygoid muscle displacement (white arrows). Additional cuts demonstrated extensive coronoid and condylar process involvement as well as anterior border perforation.

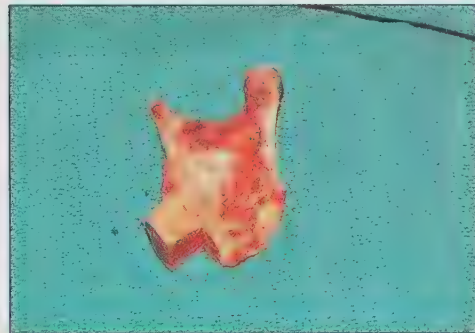


Figure 7 (Case 2): 1) Surgical specimen — medial view; 2) One-stage surgery — resection and reconstruction; 3) Extraoral approach — proximal partial mandibulectomy included entire ramus, condyle, and coronoid process. The TMJ disc was retained for immediate joint reconstruction; 4) Note extensive medial cortical perforation with an intact overlying periosteum. Note relationship of inferior alveolar nerve to cyst.

temporary fragment stabilization in order to permit immediate function when the two-stage approach is required; (e) minimize the number of operations required; and (f) provide optimal immediate and long-term functional and esthetic results, which will facilitate proper dental rehabilitation.

The role of the general dental practitioner in the management of maxillofacial pathology lies primarily in the realm of detection and rehabilitation. As health practitioners, we should perform regular oral examinations, especially on patients with histories of significant alcohol and tobacco use. Early detection decreases the chance of metastasis or spread to adjacent tissues.

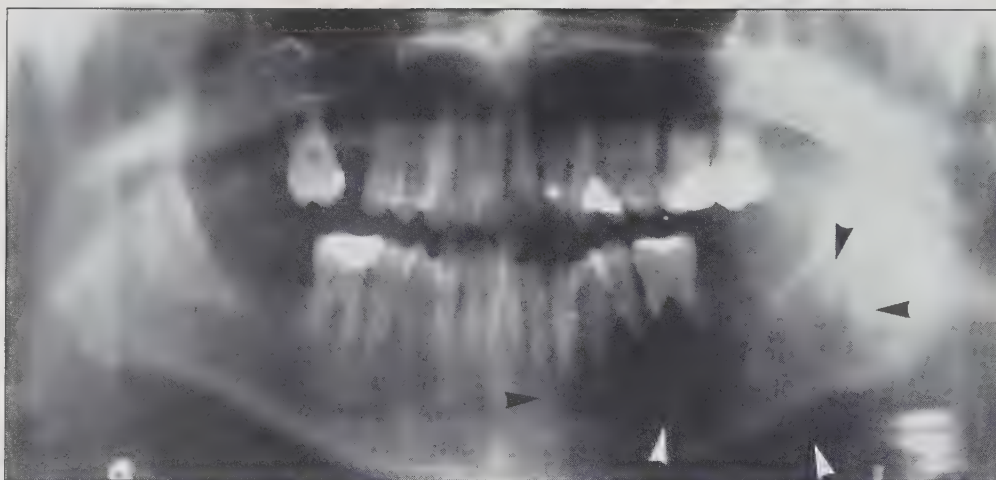


Figure 8 (Case 3): A 26-year-old male presented with an extensive ameloblastoma involving both hard and soft tissues. Panoramic radiograph exhibiting a large multilocular radiolucency extending from the parasymphysis to the vertical ramus (white and black arrows). Note prominent root resorption and inferior border involvement.

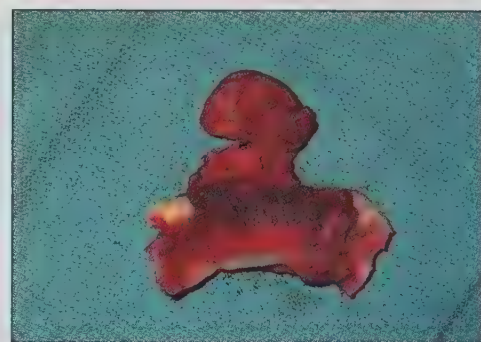


Figure 11 (Case 3): En bloc resected surgical specimen. Note attached submandibular gland medial pterygoid muscle. Note soft tissue coverage of entire specimen except at the anterior and posterior margins. The tumor is never exposed or visualized during the dissection to ensure complete removal. A one centimetre bone margin and at least one soft tissue plane margin were obtained.

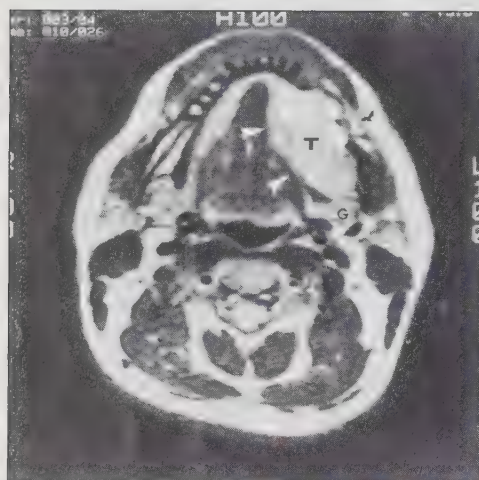


Figure 9 (Case 3): MRI - T2 weighted axial image. A well-delineated high-signal intensity heterogeneous mass (T) is noted. Medial and lateral cortical destruction is noted in conjunction with extensive medial and submandibular soft tissue invasion (arrows). Note relationship of tumor (T) to submandibular gland (G). Multiple positive mucosal and bone biopsies confirmed the MRI impression of extensive soft tissue and mucosal invasion.

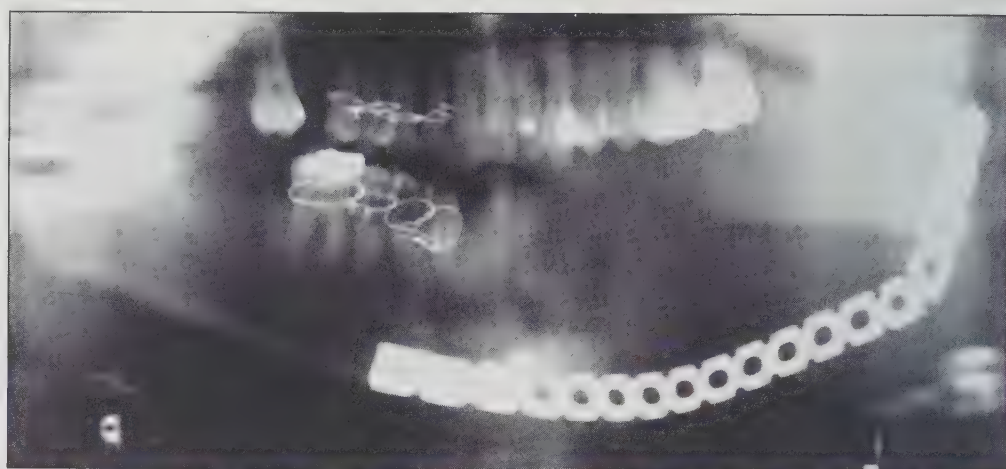


Figure 12 (Case 3): Panoramic radiograph of completed Stage 1. The temporary rigid reconstruction plate maintains mandibular fragment position and permits early restoration of mandibular function. After a healing period of four-12 months (Stage 2), definitive osseous reconstruction will be performed. Note loss of symphysis, body, angle, and ramus. The temporary rigid reconstruction plate is separated from the oral cavity by the repositioned platysma muscle flap. This flap replaces tissue lost due to the suprahyoid dissection (Fig. 11) and prevents the development of an oral-cutaneous fistula. This muscle also plays an important role during Stage 2 reconstruction.



Figure 10 (Case 3): Two Stage Surgery - Stage I. Tumor resection and temporary reconstruction. Suprahyoid neck dissection maintaining at least one surgical plane distance from the tumor. En bloc resection of masseter and medial pterygoid muscle insertions, mylohyoid muscle, submandibular gland and nodes, alveolar, lingual, buccal and floor mucosa in conjunction with hemimandibulectomy.

All the lesions discussed in this article were detected by general dental practitioners. Once a lesion is detected, an informed general practitioner can assist by helping the patient to seek appropriate treatment. This will contribute to proper diagnosis, treatment planning, and functional rehabilitation. Although the prosthetic dental phase can be quite challenging, excellent results can often be achieved. Some practitioners may elect to participate in this phase of care. By providing early detection, counselling, guidance, and dental rehabilitation, general practitioners can contribute greatly to the well-being of their patients.

This paper has presented the concept of surgical treatment planning and the management of extensive maxillofacial lesions through the combined use of advanced imaging, biopsy and oncologic surgical

techniques. The high recurrence rates described in the literature for many odontogenic lesions⁸ is likely a reflection of poor presurgical tumor delineation as well as overly conservative surgical approaches. Therefore, an attempt has been made to categorize lesions based on size and anatomical location in order to indicate preferable surgical management approaches. Finally, the inclusion of a reconstructive surgical plan in conjunction with the ablative surgical plan has been emphasized in order to ensure optimal rehabilitative results. Δ

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Figure 13 (Case 3): Two month post-op. Note the mandibular function achieved with the reconstruction plate. The patient is now ready for Stage 2 — definitive osseous reconstruction.

References

1. Ungerer, K. Introduction to the Technology of Computer Tomography. In: Baert, A., Jeamart, L. and Wackenheim, A. *Clinical Computer Tomography: Head and Trunk*. Berlin, Springer-Verlag, 1978, pp. 2-11.
2. Thornton, M. An ABC of NMR — A guide to the physics and terminology. *Radiography*. September/October 50:221-227, 1984.
3. Jarenwattananon, A. and Gentry, L.R. Magnetic Resonance Imaging of the Upper Maxillofacial Region. In: Delbalso, A.M. (ed.). *Maxillofacial Imaging*. Philadelphia, W.B. Saunders Co., 1990, pp. 521-563.
4. Schaefer, S.D., Maravilla, K.R. et al. Magnetic resonance vs. computerized tomography. Comparison in imaging oral cavity and pharyngeal carcinomas. *Arch Otolaryngol* 111: 730-734, 1985.
5. Heffez, L.B. and Mafee, M.F. The role of magnetic resonance imaging in the diagnosis and management of ameloblastoma. *Oral Surg* 65:2-12, 1988.
6. Schmoker, R.R. Mandibular reconstruction using a special plate. *J Maxillofac Surg* 11:99-106, 1983.
7. Lore, J.M., Jr. Cysts and Tumours Involving the Mandible: An Atlas of Head and Neck Surgery. Ed. 3. Philadelphia, W.B. Saunders Co., 1988, p. 570.
8. Eversole, L.R. *Clinical Outline of Oral Pathology: Radiolucent Lesions of the Jaws*. Ed. 2. Philadelphia, Lea and Febiger, 1984, pp. 229, 230 and 240.

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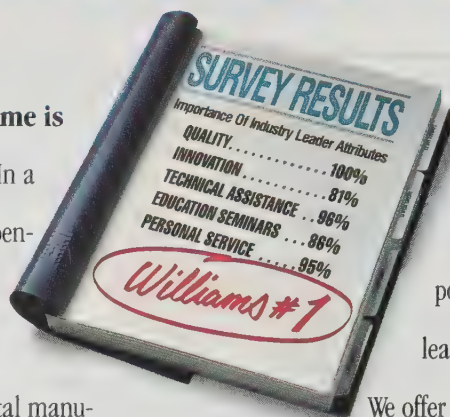
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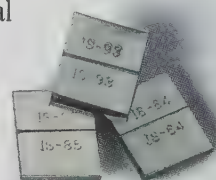
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The oral health status of older adults in four Ontario communities

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Introduction

Current demographic projections suggest that the number of elderly people in Canada will increase dramatically over the next two decades.¹ In addition, the prevalence of edentulism appears to be declining.² These trends, along with changes in attitudes towards oral health among older adults,³ will lead to a greater need and demand for dental care among this section of the population. Moreover, while oral disorders are only rarely life threatening, they can have a significant impact on social and psychological well-being. This impact is particularly marked in the elderly, many of whom report having substantial disabilities and handicaps as a result of poor oral health.⁴ For these reasons, Horowitz predicts that oral disease in the elderly will become an important public health issue.⁵

Although many dentists are becoming increasingly interested in the oral disorders of older adults, comprehensive data on the oral health status and treatment needs of this patient group are lacking. While a number of studies have been undertaken, the majority were local in scope, and limited to the elderly living in institutions or collective living centres.² National data based on clinical examinations have not been collected since the Nutrition Canada survey of 1970-72, and only one province-wide study of the elderly has been reported.⁶ In this paper, we have reported on the results of the first stage of the Ontario Study of the Oral Health of Older Adults, which examined the oral health and treatment needs of the current (age 65 and over) and the future (age 50 to 64) elderly living independently in four communities in Ontario. Our aim was to provide data that would be useful for planning at the local and provincial levels.

Materials and Methods

The target population for the study was all persons age 50 and over living in private households in the following commu-

nities: Toronto, North York, Simcoe County, and Sudbury and district. These communities were chosen because the dental directors of their respective public health departments regard the oral health care needs of the elderly as a priority. While not necessarily representative of the province as a whole, the selected communities represent a geographical section of the province from southern urban to rural to northern resource-based economies.

Subjects meeting the age requirements for the study were identified by means of a telephone survey, based on a random-digit dialing.⁷ Computer-generated telephone numbers were called and a randomization procedure was used to select individuals from all households identified as containing one or more persons aged 50 or over. After they had completed a 39-item questionnaire, the selected subjects were invited to participate in a more-detailed personal interview and clinical examination, which was conducted in their homes or at a public health department dental clinic. The clinical examination was based on methods recommended by the World Health Organization (WHO),⁸ although these methods were modified to make the data comparable to that obtained by recent surveys of adults in the United States.⁹ Individual examinations were undertaken by trained and standardized dentists and dental hygienists, who were assisted by interviewer-recorders.

The initial telephone interviews were used to collect social-demographic data as well as basic data on the oral and general health of each subject, and their use of dental services. The follow-up interviews and examinations provided data on self-reported and clinically-defined indicators of oral health and treatment needs. Self-reported indicators included oral symptomatology, oral function and the social and psychological impact of oral disorders, while clinically-defined indicators included prosthetic status; missing teeth; number of functional units; disorders of mucosa, teeth and bone; periodontal status using the community periodontal index of treatment needs (CPITN)¹⁰ and measures of attachment loss at two sites on each remaining tooth; gingival recession on all four tooth surfaces; and coronal and root caries by tooth surface. All dentures and bridges were assessed for material defects, retention-stability (where applicable) and defects in occlusion. Treatment needs for each observed oral condition were recorded.

These oral-health status indicators were analyzed by age group (50 to 64 years, 65 to 74 years and 75 years and over), gender and community of residence. Differences in proportions were assessed using the Chi-square test, while differences between means were assessed using the t-test and one-way analysis of variance.

TABLE I

Completions by Study Site

	Telephone Interview	Personal Interview and Clinical Examination
Toronto	886	254
North York	1120	305
Simcoe County	520	164
Sudbury and District	507	184
Total	3033	907

Results

Response to the surveys

Of the 33,476 telephone numbers randomly generated and called, 3,897 were identified as belonging to households containing one or more persons in the target age range. A telephone-administered questionnaire was completed by a randomly selected person in 3,033 (78 per cent) of these households. Completion rates varied from 74 per cent to 82 per cent across the communities studied. If these completions are expressed as a proportion of the estimated number of eligible households in the sample, the overall response rate was 64 per cent.

Personal interviews and clinical examinations were completed by 907 subjects or 29.9 per cent of those completing a telephone interview. These response rates are comparable to those achieved in our previous oral health surveys of older adults.¹¹⁻¹² Table I shows the number of subjects by study site.

Characteristics of subjects

Table II compares the age and gender of characteristics of the target population, the subjects completing the telephone interview and the subjects completing the personal interview and clinical examination. Table III compares the last two groups on a number of the other sociodemographic, behavioral and health status variables obtained from the telephone survey.

In terms of age, persons aged 75 years and over were underrepresented among those completing the personal interview and clinical examination and there were more women than men in both groups of study subjects when compared to the target population. A comparison of the subjects completing the telephone interview and those completing the personal interview and examination showed no significant differences for seven of the 14 variables examined. Where differences were observed, they were small in percentage terms and approached 10 per cent for one variable only — the self-perceived need for dental care. Non-response bias analysis, in which estimates derived from the clinical examinations were adjusted to the characteristics of the telephone-survey respondents and the target population, showed only minor differences in crude and adjusted means and proportions. For example, the difference in the crude estimate of the prevalence of edentulism and an estimate adjusted to the age distribution of the target population was 0.4 per cent. This is consistent with our earlier work on non-response bias in oral health surveys in older adults.¹³

TABLE II

Age and Gender Characteristics of Target Population and Study Subjects

	Target* Population	Telephone Interview Subjects	Interview and Examination Subjects
	(n = 436,956)	(n = 3,033)	(n = 907)
Age:			
50-64	57.3	58.0	58.5
65-74	25.6	26.8	29.5
75 +	17.1	15.2	12.0
Gender:			
Male	45.3	41.3	42.9
Female	54.7	58.7	57.1

*Data from 1986 census.

TABLE III

Sociodemographic and Other Characteristics of Study Subjects

	Telephone Interview Subjects	Interview and Examination Subjects	p
	%	%	
Born in Canada	60.8	64.7	ns
Employed	42.9	40.0	ns
Married	55.2	52.3	ns
Income < \$20K	38.7	38.1	ns
Higher education	31.9	36.7	p < .01
Chronic medical condition	62.1	66.8	p < .05
Limitation in ADL *	18.2	22.2	p < .01
Dentate	75.9	78.1	ns
Chewing problem	22.0	22.8	ns
Oral pain in last 4 weeks	27.1	35.3	p < .0001
Dental health rated fair/poor	22.8	27.9	p < .01
Perceived need for dental care	22.2	81.4	p < .0001
Dental visit in last year	62.3	65.8	p < .05
Dental insurance coverage	47.5	46.3	ns

*Activities of daily living

Prevalence of edentulism

Of the 3,033 persons completing the telephone interview, 24.1 per cent reported that they were edentulous. Women were more likely to be edentulous than men. However, the prevalence of edentulism, also increased with age and there were marked differences between communities. Rates varied from a low of 15.1 per cent in North York to a high of 40.6 per cent in Sudbury (Table IV).

Table V gives the age and gender-specific rates for each of the study sites. These data show that for each age group the prevalence of edentulism is lowest in North York and highest in Sudbury and dis-

trict. They also show that significant gender differences in edentulism were found only in Sudbury, where overall rates were the highest.

Mean numbers of decayed, missing and filled teeth

Data from the clinical examinations showed that the mean number of sound teeth among dentate subjects was 8.1 (SD=5.2). The mean numbers of decayed, missing and filled teeth are shown in Table VI. Overall, an average of 9.0 teeth were missing, 7.9 filled and 0.9 decayed. The number of missing teeth increased with age and was higher in the non-

metropolitan (Simcoe County and Sudbury and district) than the metropolitan (Toronto and North York) communities. Those in the youngest age group had more filled teeth, while those living in Sudbury had fewer filled teeth than subjects from the other study sites. Men had significantly more decayed teeth than women and a greater proportion of men had one or more decayed teeth (49.0 per cent versus 39.0 per cent: $p < 0.01$).

Periodontal status

Data on periodontal health, measured using the CPITN, were obtained from 607 dentate individuals. A medical history which precluded probing was reported by 72, and a further 25 had no CPITN indicator teeth. Table VII shows that 31.1 per cent had periodontal pockets of four to six millimetres and a further 12.4 per cent had pockets of six millimetres or more. Only 13.7 per cent were periodontally healthy. Periodontal health was associated with gender, age and community of residence. Men, younger subjects and those living in the non-metropolitan communities were more likely to show evidence of periodontal pocketing. Particularly high rates of pocketing were noted in Sudbury and district, the most northerly of the four study sites. Here, just over two-fifths of the subjects examined had moderate pocketing and one quarter had deep pockets. Older subjects were less likely to have pocketing because they had fewer teeth in general and fewer teeth at high risk of deep pockets in particular, and because pocket depth measurements do not take gingival recession into account, which is greater in older age groups.¹⁴

Treatment needs

Overall, 69.8 per cent of the dentate and 76.4 per cent of the edentulous subjects needed dental treatment. Table VIII shows the clinically-defined treatment needs for dentate subjects. Almost one-half needed restorations and two-fifths needed prosthetic treatment. Extractions, immediate treatment for the relief of pain and infection, and treatment for mucosal or other conditions were needed by less than one in 10. Men were more likely than women to need restorations, immediate treatment, and treatment for other conditions. A substantial proportion of the subjects living in Sudbury, 81.7 per cent, needed prosthetic care and almost 20 per cent needed immediate attention. The prevalence of treatment needs for mucosal and other conditions was highest in Simcoe County. There were no age differences in treatment needs.

Periodontal treatment needs are not included in Table VIII since they can be inferred from the data presented in Table VII. Subjects with a CPITN score of zero have no need for treatment. Subjects scoring one require oral hygiene instruction to improve levels of oral cleanliness, while subjects scoring two or three need scaling and oral hygiene instruction. Complex periodontal treatments such as deep scaling and root planing are needed by those with a CPITN score of four.

Among the 195 edentulous subjects, prosthetic care was needed by 75.4 per cent. Younger subjects and those living in the non-metropolitan communities were more likely to require this form of treatment. A small proportion of edentulous subjects needed extractions (3.6 per cent) or immediate attention (5.1 per cent),

largely for retained roots, and a small proportion needed treatment for mucosal and other conditions (4.1 per cent).

Self-reported indicators of oral health status

Data were collected relative to four self-reported indicators of oral health. These were a functional measure in the form of an index of chewing capacity, a measure of pain and other oral symptoms, a measure of the social and psychological impact of oral conditions and a rating of satisfaction with oral health. The index of chewing capacity consisted of a list of six foods of varying texture and consistency.¹⁵ Pain and other symptoms were assessed using a 22-item checklist that referred to the four weeks prior to the interview, and the social and psychological impact of oral disorders

TABLE IV
Prevalence of Edentulism

	n	%	p
All:	3033	24.1	
Gender:			
Male	1252	21.8	< .05
Female	1781	25.7	
Age Group:			
50-64	1702	16.8	< .0001
65-74	784	30.2	
75+	447	40.8	
Community:			
Toronto	886	22.7	< .0001
North York	1120	15.1	
Simcoe County	520	29.7	
Sudbury & District	519	40.6	

Data from telephone interview survey.
Note: Category totals may not add up to 3033 due to missing data.

TABLE V
Age and Gender Specific Prevalence of Edentulism by Study Site (%)

	Toronto	North York	Simcoe County	Sudbury and District	p
Age:					
50-64	14.7	8.3	19.8	34.9	< .0001
65-74	27.0	22.3	31.9	49.0	< .0001
75+	41.8	30.4	49.1	53.8	< .01
p	< .0001	< .0001	< .0001	< .01	
Gender:					
Male	21.8	12.9	29.9	33.3	< .0001
Female	23.4	16.7	29.5	45.9	< .0001
p	ns	ns	ns	< .01	

Data from telephone interview survey.

was assessed by means of a seven-item index that referred to problems with eating, communication and social interaction. Satisfaction was measured by means of three items concerning satisfaction with different components of oral health.

Table IX presents the results of the analysis of these self-reported indicators, which was based on the dental status (dentate versus edentulous) gender, age and community of residence of each subject.

Overall, 30.5 per cent of the subjects were unable to chew one or more of the six indicator foods. Almost two-thirds of the edentulous and one-fifth of the dentate subjects reported a problem with chewing. Women were more likely to report a problem with chewing than men, and problems were more common in the older age groups. Analysis by age and dental status showed that 73.0 per cent of edentulous persons over the age of 65 were unable to chew some foods.

In the four weeks prior to the interview, 37.0 per cent of the subjects had experienced oral or facial pain and 53.1 per cent had one or more other symptoms. Dry mouth was reported by 17.5 per cent, denture pain by 14.3 per cent and toothache by 8.7 per cent of dentate. Of those reporting pain, one-quarter said it was moderately severe or severe and 19.0 per cent reported experiencing a pain-related disability such as sleep disturbance, diet modification or staying home more. Those reporting moderately severe or severe pain represent 8.6 per cent of all subjects. Of those reporting other symptoms and conditions, 22.5 per cent said that they were moderate or severe. Women and the edentulous were more likely to report pain and other oral symptoms.

Responses to the seven items that addressed problems with eating, communication and social interaction were categorized according to the frequency at which these conditions occurred: never, sometimes, fairly often, very often, and all of the time. The percentage reporting that they experienced the above problems sometimes or more frequently were: prevented from eating foods they would like to eat – 20.3 per cent; enjoyment of food less than it used to be – 14.2 per cent; taking longer to finish a meal than other people – 15.7 per cent; avoiding eating with other people because of chewing problems – 5.2 per cent; embarrassed by the appearance or health of the teeth or mouth – 14.2 per cent; avoiding laughing or smiling – 7.8 per cent; avoiding conversation with others – 2.4 per cent. Overall, 36.8 per cent reported one or more of these problems, which were generally experienced to a greater degree by the

TABLE VI

Mean Missing, Decayed and Filled Teeth (SD) Dentate Only

	n	Decayed	Missing	Filled
All dentate:	702	0.9 (1.5)	9.0 (7.5)	7.9 (5.6)
Gender:				
Male	310	1.2*** (1.8)	8.8 (7.2)	7.6 (5.4)
Female	390	0.7 (1.1)	9.0 (7.8)	8.2 (5.8)
Age Group:				
50-64	432	0.9 (1.5)	7.6*** (7.0)	8.6** (5.7)
65-74	195	0.9 (1.5)	10.7 (7.7)	6.7 (5.4)
75+	75	1.1 (1.5)	12.4 (7.8)	7.0 (5.4)
Community:				
Toronto	198	0.9 (1.7)	8.1* (7.7)	8.4* (5.9)
North York	258	0.9 (1.4)	8.5 (7.4)	8.1 (5.3)
Simcoe County	131	0.8 (1.4)	9.7 (7.6)	8.0 (5.9)
Sudbury and District	115	1.2 (1.5)	10.6 (7.0)	6.4 (5.4)

Data from clinical examination survey.
Category totals may not add up to 702 due to missing data.
*p<.05 **p<.001 ***p<.0001

TABLE VII

Periodontal Health Measured Using the CPITN Dentate Subjects (%)

CPITN Category	n	0	1	2	3	4
		Periodontal Health	Gingival Bleeding	Calculus	Pockets 4-5mm	Pockets 6+ mm
All dentate:	607	13.7	7.1	35.6	31.3	12.4
Gender:						
Male	272	8.8	6.6	36.4	32.4	15.8**
Female	332	17.5	7.5	34.9	30.7	9.3
Age:						
50-64	388	13.1	5.4	34.5	33.5	13.4*
65-74	163	14.7	7.4	37.4	29.4	11.0
75+	55	14.5	18.2	38.2	21.8	7.3
Community:						
Toronto	173	20.2	8.1	36.4	26.6	8.7***
North York	220	15.0	6.4	40.9	30.0	7.7
Simcoe County	109	12.8	13.8	31.2	28.4	13.8
Sudbury and District	105	1.0	0.0	27.6	44.8	26.7

Category totals may not add up to 607 due to missing data
*p<.05 **p<.01 ***p<.001

edentulous and those over 75. As a result, almost one-third of the subjects were dissatisfied with their oral health, and this percentage did not vary by age, gender or community of residence.

Discussion

The most striking findings of this study are the low overall rate of edentulism, the significant geographic differences in oral

health status, the high rates of treatment need and the extent to which oral conditions compromise the quality of life of older adults.

The overall rate of edentulism among subjects in this study is virtually identical to the rates observed in our previous studies in East York and Ottawa-Carleton, Ontario.¹⁰⁻¹¹ All confirm the substantial reduction in edentulism suggested by

cross-sectional studies undertaken in Ontario over the last 20 years. These indicate a decline in edentulism of the order of 20 per cent to 45 per cent among independently-living older people.² Among the subjects aged 50 to 64 who took part in this study, only 16.8 per cent had lost all their teeth. As this cohort ages, then edentulism rates at the upper end of the age span will begin to fall rapidly.

Although the overall rate of edentulism was low, there were significant differences in the individual edentulism rates across the four study sites. Sudbury had a prevalence rate over 2.5 times that of North York. Analysis by age showed that these differences were apparent in each of the three age groups examined. Moreover, the rate among North York subjects age 75 and over was less than that of Sudbury subjects age 50 to 64. Whether these differences are the product of differences in patterns of dental disease, access to dental care or patterns of dental treatment is difficult to determine, given the cross-sectional design of the study. However, since subjects in Sudbury had more missing and fewer filled teeth, in addition to worse periodontal health, it is probably the case that all three factors have contributed to the differences observed.

The high rates of treatment need observed in this study are similar to those found in our previous studies in East York and Ottawa-Carleton, Ontario. In these previous studies, high rates of treatment need existed alongside high rates of dental

TABLE VIII
Clinically Defined Treatment Needs: Dentate Subjects

	n	Restorations	Extractions	Treatment Need		
				Prosthetic	Immediate	Other
All dentate:	702	47.0	6.4	42.2	6.5	6.8
Gender:						
Males	310	51.9*	6.8	44.8	9.7*	9.4*
Females	390	44.0	6.2	40.4	4.9	4.9
Age:						
50-64	432	47.0	6.7	40.7	6.5	6.0
65-74	195	44.6	6.2	43.5	6.7	8.8
75+	75	56.0	5.3	48.0	10.7	6.7
Community:						
Toronto	198	50.0	7.6	34.8***	6.0***	8.1*
North York	258	45.2	5.4	34.7	3.9	4.2
Simcoe County	131	46.5	3.1	34.1	3.8	11.6
Sudbury and District	115	47.8	10.4	81.7	19.1	5.2

Category totals may not add up to 702 due to missing data
*p<.05 **p<.01 ***p<.0001

TABLE IX
Self-reported Oral Health Indicators: All Subjects (%)

	n	Chewing Problem	Pain in Last 4 Weeks	Other Symptoms in Last 4 weeks	1 + Impacts	Dissatisfied with Oral Health
All:	907	30.5	37.0	53.1	36.8	30.8
Gender:						
Male	385	23.5*	31.8**	48.1**	33.6	29.7
Female	509	35.7	40.0	57.1	39.4	31.7
Age:						
50-64	526	23.9***	35.9	54.7	34.2*	31.0
65-74	265	37.8	37.8	52.4	37.8	32.6
75+	108	45.4	40.7	47.2	47.2	25.0
Community:						
Toronto	254	34.3	39.8	53.1	42.5	34.3
North York	305	28.5	34.8	51.5	33.8	25.9
Simcoe County	104	32.3	41.5	60.4	40.2	31.1
Sudbury and District	184	27.2	33.5	49.5	31.0	33.7
Dental Status:						
Dentate	702	21.2***	35.2*	50.9*	31.8***	27.6**
Edentulous	195	64.9	43.8	61.3	55.2	42.3

Data from personal interview survey. Category totals may not add up to 907 due to missing data.
*p<.05 **p<.001 ***p<.0001

care utilization. Leake et al¹⁰ have identified a number of potential explanations for this apparent anomaly, which will be pursued further in future analyses of our data.

These data also indicate that pain and other symptoms associated with oral conditions are quite common among older adults and that a substantial proportion of these people is compromised by oral disorders in everyday life. Almost two-fifths experienced pain, one-third reported a problem with chewing and one-third had problems with eating or communication. These problems were more marked in subjects age 75 and older and the edentulous. It is interesting to note that although subjects living in Sudbury had worse oral health when assessed by clinical indicators, this fact was not reflected by their self-reported indicators. Perhaps the differences in attitudes and expectations regarding oral health and the processes of aging among subjects at different study sites may be the cause of this discrepancy.

Clearly, the geographic inequalities in oral health and the impact of oral disorders on the quality of life of these and future generations of older adults need to be addressed by both policy makers and the dental profession. As Canada's population ages, the numbers of older adults with oral health care needs will increase and appropriate levels of resources should be allocated to this emerging issue. Δ

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References

1. Denton, F.T., Feaver, C.H. and Spencer, B.G. The Canadian population and labour force: retrospect and prospect. In: Marshall, V.W. (ed), *Aging in Canada: Social Perspectives*, Ed. 2. Markham, Ontario, Fitzhenry and Whiteside, 1987.
2. Leake, J.L. A review of regional studies on the dental health of older Canadians. *Gerodontology* 7:11-19, 1988.
3. Ettinger, R.L. and Beck, J.D. The new elderly:

what can the dental profession expect? *Spec Care Dent* 2:62-69, 1982.

4. Smith, J.M. and Sheiham, A. How dental conditions handicap the elderly. *Commun Dent Oral Epidemiol* 7:305-310, 1979.

5. Horowitz, H. The National Institute of Dental Research's 1985 Survey of Working and Senior Adults. *J Pub Health Dent* 45:227-228, 1985.

6. Simard, P.L., Brodeur, J-M, Kandelman, D. et al. Oral health status and needs of the elderly in Quebec. *J Canad Dent Assn* 51:43-46, 1985.

7. Dillman, D. *Mail and Telephone Surveys: The Total Design Method*. New York, John Wiley and Sons, 1978.

8. World Health Organization. *Oral Health Surveys: Basic Methods*, Ed. 2. Geneva, WHO, 1977.

9. National Institute for Dental Research. Oral Health of US Adults: NIDR 1985 National Survey. *J Pub Health Dent* 47:198-205, 1987.

10. Ainamo, J., Beagrie, G., Cutress, T. et al. Development of World Health Organization (WHO) community periodontal index of treatment needs. *Int Dent J* 32:281-291, 1982.

11. Leake, J.L., Locker, D., Price, S. et al. Results of the sociodental survey of people aged 50 and over living in East York, Ontario. *Can J Pub Health* 81:120-124, 1990.

12. Slade, G., Locker D., Leake, J.L. et al. The oral health and treatment needs of adults aged 65+ living independently in Ottawa-Carleton. *Can J Pub Health* 81:114-119, 1990.

13. Locker D., Slade, G. and Leake, J.L. The response rate problem in oral health surveys of older adults in Ontario. *Can J Pub Health* 81:210-214, 1990.

14. Locker, D., Slade, G. and Leake, J.L. Prevalence of and factors associated with root decay in older adults in Canada. *J Dent Res* 68:768-772, 1989.

15. Leake, J.L. An index of chewing ability. *J Pub Health Dent* 50:262-267, 1990.

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La validité concomitante et discriminante de l'Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s

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RÉSUMÉ

La version révisée de l'Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s (ICPTD-A) est administrée à 38 sujets choisis de façon aléatoire et à neuf sujets choisis en raison d'une peur manifeste des traitements dentaires. La validité concomitante de l'instrument de mesure est déterminée en corrélant les scores de l'ICPTD-A avec ceux d'un test d'approche comportemental. Les coefficients de corrélations de Pearson ainsi obtenus sont de $-0,66$ pour la population générale et de $-0,87$ pour la population manifestant une peur des traitements dentaires. La validité discriminante est ensuite déterminée à l'aide d'une analyse de variance à mesures répétées faite à partir des scores obtenus chez les sujets manifestant une peur des traitements dentaires après qu'un programme de traitement psychologique de valeur reconnue pour réduire cette peur leur ait été administré. Les résultats révèlent une différence statistiquement significative entre les groupes expérimental et contrôle en plus de révéler une différence significative entre le pré-test et le post-test. Les auteurs concluent que l'ICPTD-A est un instrument valide pour mesurer la peur des traitements dentaires chez les adolescents de 12 à 15 ans.

ABSTRACT

The revised edition of the Inventaire cognitif de la peur des traitements dentaire pour adolescent(e)s [Adolescents' Fear of Dental Treatment Cognitive Inventory] (ICPTD-A) was administered to 38 subjects chosen at random and to nine subjects chosen with an obvious dental phobia problem. Its concomitant validity was established by relating the ICPTD-A scores to those of a behavioral test. The Pearson correlation coefficients that were thus obtained were -0.66 for the general popu-

lation and -0.87 for the population suffering from dental phobia. The discriminatory validity was then established with a repeated measurement variance analysis based on the scores of the dental phobics after the administration of a recognized psychological treatment program intended to reduce their phobia. The results have shown a statistically significant difference between the experimental and control groups as well as a significant difference between pre- and posttreatments. The authors have therefore concluded that the ICPTD-A is a valid tool for the assessment of dental phobia in 12-15-year-old adolescents.

Le maintien d'une bonne condition dentaire chez les jeunes canadiens est un problème qui préoccupe depuis longtemps tous les intervenants en santé dentaire. À cette fin, plusieurs stratégies ont été développées, allant des multiples apports en fluorure jusqu'aux divers programmes de dépistage, d'éducation et de sensibilisation. Cependant, l'amélioration de la santé dentaire ne se manifeste pas uniformément chez tous les jeunes. Les données recueillies en 1983-84 par l'Enquête Santé dentaire Québec¹ indiquent qu'il existe une forte prévalence de la carie dentaire chez les 12-14 ans et ce, malgré un déclin de 33 pour cent dans la prévalence de la carie au Québec entre 1977 et 1984.² Une étude de Brodeur et ses collègues (1986)² démontre aussi que la carie ne se distribue pas également chez les adolescents. Ces chercheurs ont trouvé que 12 pour cent des adolescents de 13-14 ans détiennent 70,5 pour cent de toutes les surfaces dentaires cariées. L'Enquête Santé dentaire Québec¹ indique également que la faible utilisation des services dentaires serait un facteur déterminant de cette situation. Il s'ensuit que nous aurions peut-être avantage à nous interroger sur les différents facteurs qui peuvent

influencer l'utilisation des services dentaires chez les adolescents à risque si on désire effectuer des progrès dans ce domaine.

L'une des variables qui mérite sans doute d'être investiguée dans le cadre de la santé dentaire et de l'utilisation des services dentaires est l'évitement pouvant être causé par la peur des traitements dentaires (voir note). En effet, bien qu'il n'existe pas, à notre connaissance, de statistiques sur ce sujet au Canada, des sondages auprès de quinze millions d'Américains révèlent qu'au minimum cinq à six pour cent de la population ont une peur si intense des traitements dentaires qu'ils évitent complètement ces traitements au détriment avoué de leur santé dentaire.³⁻⁵ D'autres sondages indiquent également que jusqu'à 15 pour cent de la population générale évitent les services dentaires à cause de la peur des traitements dentaires.⁶ Nous avons aussi relevé une enquête effectuée auprès de plus de 500 dentistes cliniciens dans le but d'identifier les problèmes les plus fréquemment rencontrés dans leur pratique privée.⁷ Cette enquête indique que la peur chez les patients est en tête de liste pour 87,4 pour cent des dentistes, passant avant les rendez-vous manqués et le faible intérêt manifesté pour l'hygiène dentaire.

Comme on peut le constater, les justifications empiriques pour l'étude de la relation entre la peur des traitements dentaires et la mauvaise santé dentaire et le faible taux d'utilisation des services dentaires chez un certain pourcentage de nos adolescents ne manquent pas. Cependant, avant d'être en mesure d'effectuer de telles études, il est important de s'assurer que nous possédons un instrument de mesure valide et précis qui vous permettra de détecter la peur des traitements dentaires dans notre population-cible. Bien entendu, pour que l'instrument soit utile, il faut aussi qu'il soit simple et économe d'administration. Afin de combler la lacune qui existait

au niveau de la mesure et ainsi permettre le genre d'études auxquelles nous faisons ici référence, Morin, Gauthier, Ricard et Dufour (1987)⁸ ont développé un questionnaire qui a fait récemment l'objet de révision suite à certaines analyses psychométriques.⁹ Il s'agit de l'Inventaire Cognitif de la Peur des Traitements Dentaires pour Adolescent(e)s (ICPTD-A). Une analyse factorielle du questionnaire a révélé un facteur général rendant compte de 33,5 pour cent de la variance totale. Le degré de consistance interne mesuré à l'aide de la formule 20 de Kuder-Richardson a mis en évidence un coefficient alpha d'une valeur de 0,91. Une mesure de fidélité test-retest pour une période de quatre semaines indique que l'instrument est stable ($r = 0,85$). La valeur de l'erreur-type de mesure du score total est de 4,63. Une table de normes basée sur un échantillon de 343 sujets est également disponible pour faciliter l'interprétation des scores bruts.⁹ Comme l'indiquent les analyses faites jusqu'ici, les qualités psychométriques de l'ICPTD-A sont excellentes. Toutefois, pour ce qui est de la question de la validité du questionnaire, il importe de souligner que seule la validité de contenu a été établie. Ceci signifie que, si on désire véritablement s'assurer de la validité de l'ICPTD-A, il faut que d'autres analyses soient effectuées.

Le but de la présente étude est précisément de répondre à ce besoin. Pour ce faire, deux différentes procédures sont utilisées. Dans la première, l'ICPTD-A est mis en relation avec un test comportemental dont la validité pour mesurer la peur des traitements dentaires est déjà reconnue, ce qui permet d'explorer la validité concomitante du questionnaire. Dans la deuxième, l'ICPTD-A est utilisé pour mesurer les progrès thérapeutiques de sujets qui ont peur des traitements dentaires et qui font l'objet d'un traitement dont l'efficacité est également reconnue, ce qui permet d'explorer la validité discriminante de l'instrument de mesure. Comme on peut le constater, la présente recherche s'inscrit dans la suite des analyses psychométriques qui ont déjà été faites de l'instrument.

Hypothèses

Les hypothèses posées en rapport avec les buts de l'étude sont les suivantes : (1) les scores de l'ICPTD-A corréleront négativement et significativement avec les scores du test comportemental; et (2) les scores de l'ICPTD-A seront significativement moins élevés après qu'avant le traitement et cette différence sera significativement plus grande dans le groupe traitement que dans le groupe contrôle.

Méthode

Validité concomitante

La validité concomitante a été mesurée de deux façons. Premièrement, 38 adolescents de 12 à 15 ans, 11 garçons et 17 filles, provenant de trois écoles secondaires de la région de Québec ont été invités à venir passer un test d'approche comportemental et à répondre à l'ICPTD-A dans le cadre d'une séance d'information sur la médecine dentaire. La relation entre le test comportemental et l'ICPTD-A est mesurée par simple corrélation entre les scores ainsi obtenus pour ce premier échantillon général d'adolescents.

Dans un deuxième temps, 17 sujets de 12 à 15 ans ont été recrutés par l'entremise d'un communiqué dans les médias électroniques de la région de Québec, invitant les adolescents qui évitent les soins dentaires à participer à un programme de désensibilisation systématique de la peur des traitements dentaires. Pour être admis dans l'étude, les sujets devaient avoir le consentement écrit de leurs parents ou tuteurs et devaient aussi avoir refusé l'injection d'anesthésique lors d'un premier test d'approche comportemental de la situation dentaire clinique.¹⁰ Onze sujets répondant aux critères de sélection ont été acceptés dans l'étude et, de ce nombre, trois garçons et six filles ont participé au programme jusqu'à la fin. Leurs scores au test d'approche comportemental et à l'ICPTD-A pendant l'évaluation pré-traitement ($n = 9$) ont été comparés de la même façon que pour le groupe qui s'était porté volontaire pour une séance d'information.

Validité discriminante

Les sujets recrutés en raison de la peur des traitements dentaires étaient répartis aléatoirement dans deux groupes : un groupe expérimental ($n = 7$) et un groupe contrôle ($n = 9$). Le groupe expérimental a fait l'objet de six rencontres d'une durée de 90 minutes chacune qui ont pris place sur une période de deux semaines. Les rencontres comprenaient une entrevue d'évaluation pré-traitement visant à déterminer le niveau de base de peur des traitements dentaires (cette rencontre n'est pas à confondre avec l'entrevue de sélection qui s'était déroulée une semaine auparavant), quatre rencontres pendant lesquelles les sujets ont reçu une thérapie cognitivo-comportementale pour la peur des traitements dentaires, et une rencontre d'évaluation post-traitement. Le programme de traitement était basé sur celui qui avait été utilisé avec succès auparavant avec des populations adultes pour Gauthier et ses

collègues.^{10,11} Ce programme comprenait essentiellement les étapes suivantes : (1) informations générales sur le développement de la peur des traitements dentaires et sur la situation dentaire clinique que les sujets auront à confronter; (2) entraînement à la relaxation; (3) exposition à la situation dentaire par la voie d'un vidéo; (4) restructuration cognitive; et (5) exposition graduelle à la situation dentaire réelle (*in vivo*).

Les évaluations pré-traitement et post-traitement consistaient en l'administration des tests suivants : l'ICPTD-A révisé⁹ qui est un questionnaire où 23 items sont cotés d'un à cinq et dont le score total reflète le degré de peur des traitements dentaires (un score élevé signifiant une forte peur des traitements dentaires); et un test d'approche comportemental^{10,11} comprenant 21 items décrivant les principales étapes d'une obturation dentaire et où un score faible indique une forte peur des traitements dentaires.

Les sujets du groupe contrôle, pour leur part, étaient amenés à croire que la première phase du programme comprenait deux semaines d'évaluation durant lesquelles ils auraient à compléter à deux reprises un questionnaire et un test comportemental pour mesurer la peur des traitements dentaires. Les intervalles entre les deux rencontres d'évaluation correspondaient aux intervalles entre le pré-test et le post-test du groupe expérimental. Le but de cette stratégie était de contrôler la modification possible des cognitions des sujets dans le temps, modification pouvant résulter du passage du temps ou de la répétition du questionnaire.

On notera que les deux groupes ont été retestés après quatre semaines (test de rappel) et que, par la suite, le groupe contrôle a pu bénéficier du traitement complet de la peur des traitements dentaires. La validité discriminante a été vérifiée en examinant l'évolution des scores obtenus à l'ICPTD-A dans les deux conditions expérimentales.

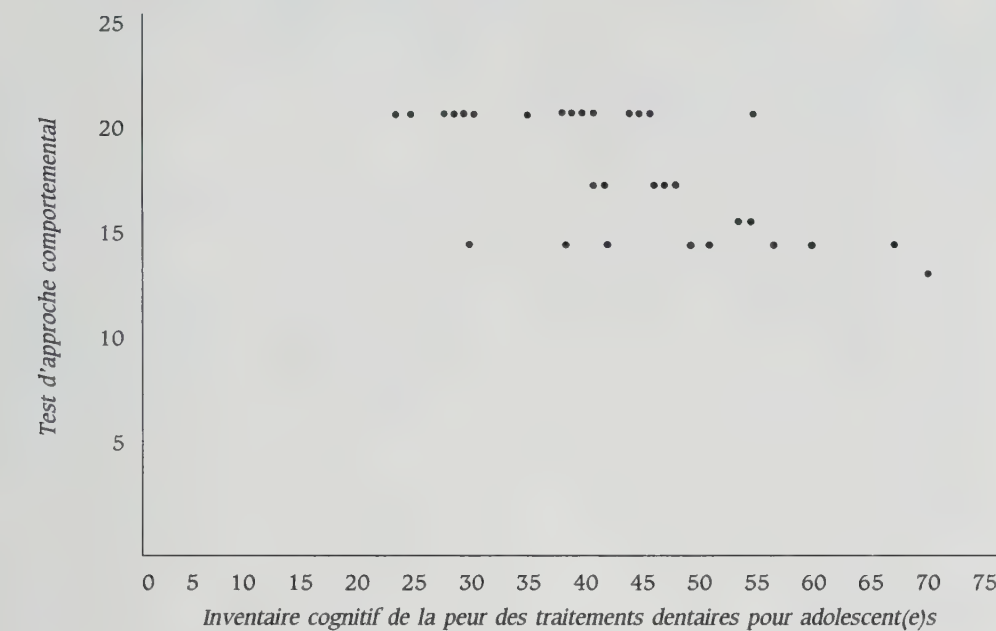
Résultats

Validité concomitante

La validité concomitante a d'abord été vérifiée en mettant en relation les scores de l'ICPTD-A avec ceux du test d'approche comportemental pour l'échantillon général d'adolescents (i.e. ceux n'ayant pas été recrutés spécifiquement pour la peur des traitements dentaires) (voir Figure 1). Le coefficient de Pearson obtenu entre les scores des 38 sujets testés est de $-0,66$, révélant une relation inversement proportionnelle entre les deux construits. Un test de signification indique que cette

FIGURE I

Scores obtenus au test d'approche comportemental en fonction de ceux obtenus à l'Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s



corrélation se différencie significativement de zéro [$t(36) = -5,43; p < 0,001$].

La validité concomitante a également été vérifiée chez les deux groupes de sujets manifestant une peur des traitements dentaires. Ceci a été fait en utilisant les données du pré-test. Le coefficient de corrélation obtenu entre les scores de l'ICPTD-A et ceux du test d'approche comportemental pour ces sujets est de $-0,86$ [$t(7) = -4,46; p < 0,01$].

Comme on peut le constater à l'examen des deux coefficients de corrélation, la relation entre les deux mesures semble plus grande chez les sujets qui ont peur des traitements dentaires que chez les autres sujets. Cette différence n'est cependant pas statistiquement significative pour un niveau de confiance de $0,95$ ($z = 1,091$).

Validité discriminante

Les moyennes et écarts-type des scores de l'ICPTD-A pour le groupe traitement et contrôle aux différents moments dans le temps sont présentés dans le Tableau I. Une comparaison des moyennes obtenues par les deux groupes expérimentaux au pré-test ne révèle aucune différence significative, suggérant ainsi qu'elles sont statistiquement équivalentes [$t(7) = 0,72$]. Afin de vérifier la sensibilité de l'ICPTD-A à détecter les progrès thérapeutiques des sujets qui reçoivent le traitement, une analyse de variance à deux facteurs avec mesures répétées pour un facteur est effectuée sur les données du pré-test, du post-

test et du test de rappel pour les deux conditions expérimentales. Cette analyse révèle qu'il existe des différences significatives entre les deux conditions lorsque l'on tient compte du temps de passation du questionnaire [$F(2,14) = 33,05; p < 0,001$]. Les tests d'effets simples indiquent que les différences entre les conditions expérimentales se manifestent autant lors du post-test [$F(1,7) = 33,50; p < 0,001$] que lors du test de rappel [$F(1,7) = 45,50; p < 0,001$], ajoutant ainsi à la confirmation de la validité discriminante de l'ICPTD-A. Les effets principaux « groupes » et « temps » sont également significatifs. Cependant, en raison des objectifs de cette étude, ces effets ne sont pas analysés.

TABLEAU I

Moyennes et écarts-types des scores de l'Inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s lors du pré-test, du post-test et du test de rappel pour les groupes contrôle et expérimental

	Pré-test		Post-test		Rappel	
	M	ET	M	ET	M	ET
Conditions						
Expérimentale	66,6	4,4	41,4	3,0	44,6	4,0
Contrôle	64,3	5,4	59,3	6,1	63,5	4,4

Une analyse des scores individuels dans le groupe traitement indique que tous les sujets se sont améliorés de 50 pour cent ou plus. Ainsi, il semblerait que les différences significatives obtenues entre les deux groupes expérimentaux soient dues à une amélioration thérapeutique de l'ensemble du groupe et non à un sous-ensemble.

Discussion

Il est clair qu'il existe une forte relation entre les scores du test d'approche comportemental et ceux de l'ICPTD-A pour les sujets qui ont peur des traitements dentaires, confirmant notre première hypothèse, ce qui indique que ce dernier est un instrument valide pour la détection de la peur des traitements dentaires chez les jeunes adolescents. Au niveau de l'échantillon général, la relation entre les scores des deux instruments de mesure tend à être moins forte. Nous croyons que ceci s'explique par la distribution moins linéaire des scores du test comportemental chez les sujets dont la peur des traitements dentaires est faible. Comme l'indique la Figure 1, plusieurs de ces sujets semblent obtenir le score maximum au test d'approche comportemental (21) alors que le score minimum à l'ICPTD-A (23) est rarement atteint. En effet, on observe plus de variance inter-sujets dans les scores à l'ICPTD-A qu'au test comportemental. Ceci ne signifie cependant pas que l'ICPTD-A a une moins bonne capacité de détecter les sujets qui n'ont pas peur des traitements dentaires. Au contraire, ces considérations suggèrent que l'ICPTD-A est peut-être une mesure plus sensible que le test comportemental pour différencier différents degrés de peur des traitements dentaires.

La comparaison statistique des scores entre les groupes traitement et contrôle confirme aussi clairement la validité discriminante de l'ICPTD-A, répondant ainsi à notre deuxième hypothèse. Bien que le

nombre de sujets de notre étude soit petit, il importe de noter que les effets thérapeutiques sont présents chez tous les sujets traités. Sachant que les chances de détecter des différences significatives entre deux groupes expérimentaux sont plus faibles lorsque les échantillons de sujets sont plus petits (la variabilité dans les données a plus de chances d'obscurcir les différences qui existent entre les groupes), il n'y a pas lieu de croire qu'une augmentation du nombre de sujets dans chaque condition donnerait lieu à un patron de résultats différents. De plus, l'analyse de variance à mesures répétées permet non seulement de comparer les sujets entre eux mais aussi de comparer le nombre de fois qu'un même score est répété,¹² nous permettant entre autre d'analyser nos résultats avec un degré de liberté plus élevé.

Il nous apparaît donc, à l'instar des études psychométriques déjà rapportées,⁹ que l'ICPTD-A est un excellent instrument de mesure de la peur traitements dentaires chez les adolescents de 12 à 15 ans. Grâce à cet instrument, nous sommes maintenant en mesure d'explorer l'impact possible de la peur des traitements dentaires sur la santé dentaire de nos adolescents et l'utilisation qu'ils font des services dentaires, tel que suggéré au début de cet article. Δ

Note : Les termes « peur », « anxiété » et « phobie » sont souvent utilisés sans distinction par les différents auteurs

qui se sont penchés sur cette question. Nous préférons ici utiliser le concept de « peur des traitements dentaires » parce que les termes « phobie » et « anxiété » réfèrent à des psychopathologies qui ont des critères diagnostiques précis, tels que ceux décrits dans la troisième édition révisée du *Diagnostic and Statistical Manual of Mental Disorders* publié par l'American Psychiatric Association en 1987.¹³

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Références bibliographiques

1. Payette, M., L'heureux, J.B. et Lepage, Y. Enquête Santé dentaire Québec 1983-84 (rapport complémentaire, volet provincial A.H.R.-M.S.S.S.). Montréal, Québec. 1987.
2. Brodeur, J.M., Payette, M., L'heureux, J.B. et al. The declining caries prevalence in Quebec and

the importance of high risk children as a future possible source of improvement. *J Dent Res* 65:197, 1986.

3. Crockett, B. Dental Survey: South Eastern State College. *J. Okla State Dent Assoc.* 55:25, 1965.

4. Ingersoll, B.D. Behavioral Aspects in Dentistry. East Norwalk, CT, Apple-Century-Crofts, 1982.

5. Klepac, R.K. Fear and avoidance of dental treatment in adults. *Ann Behav Med*, 8:17-22, 1986.

6. Gatchel, J.G., Ingersoll, B.D., Browman, L., et al. The prevalence of dental fear and avoidance: A recent survey study. *JADA* 107(4):609-610, 1983.

7. Ingersoll, B.D., Ingersoll, T.G., McCutcheon, W.R. et al. Behavioral aspects of dental practise: A national survey. Manuscript non-publié. West Virginia University School of Dentistry, 1979.

8. Morin, B., Gauthier, J., Ricard, S. et al. Élaboration d'un inventaire cognitif de la peur des traitements dentaires pour adolescent(e)s. Manuscrit non-publié, Université Laval, École de psychologie, Laboratoire de médecine comportementale, Québec.

9. Gauthier, J., Ricard, S., Morin, B. et al. La peur des traitements dentaires chez les jeunes adolescents : développement et évaluation d'une mesure cognitive. *J Can Dent Assoc*, 57: , 1991.

10. Gauthier, J., Savard, F., Hallé, J.P. et al. Flooding and Coping Skills Training in Management of Dental Fear. *Scand J Behav Ther*, 14:3-15, 1984.

11. Gauthier, J., Laberge, B., et Dufour, L. Traitement de la phobie des soins dentaires. Manuscrit non-publié, 1985.

12. Kirk, R.E., Experimental design, second edition, Monterey, California, Brooks/Cole, 1982.

13. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, third edition, Washington, DC, 1987.

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HOW TO BE A LOCAL HERO

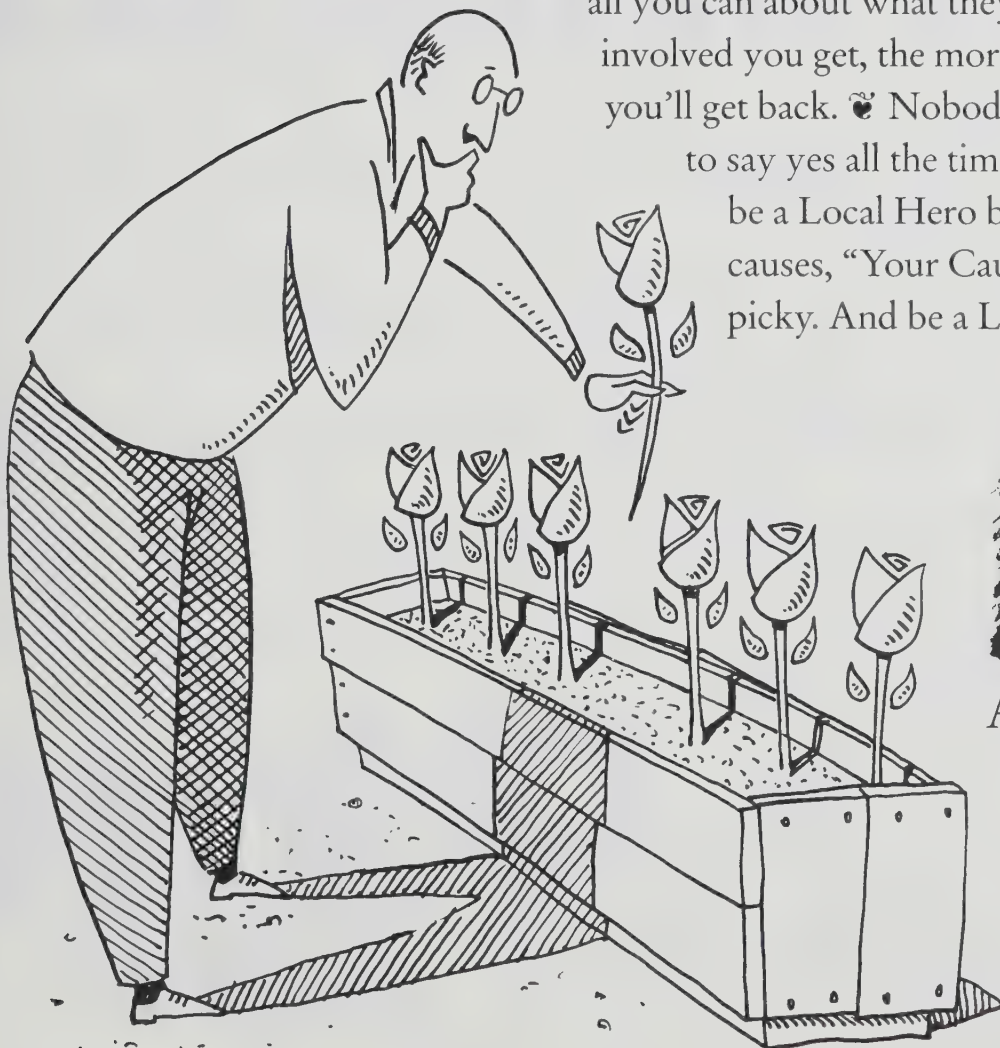


BE PICKY

Do you ever feel overwhelmed by all the good causes that ask for donations?

You'd like to help every one, but it's just not possible. Local Heroes know that the answer is to be picky. 🌹 Review the causes you already support and be sure that your experience with each of them is rewarding. 🌹 Then think about other issues you feel are critical to you and your community. 🌹 Now look for the organizations that work in these areas. Call them up, visit their offices, or write for their brochures and find out

all you can about what they do. The more involved you get, the more satisfaction you'll get back. 🌹 Nobody expects you to say yes all the time, but you can be a Local Hero by making some causes, "Your Causes". So be picky. And be a Local Hero.



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October 3-5
28th Annual Scientific Meeting – Dentistry 2000
Canadian Academy of Restorative Dentistry
(604) 734-3720

October 4, 1991
Effective Dental Practice Management: What is it all about?
Alberta Academy of General Dentistry
Dr. D.C. Yu (403) 428-9166
or (403) 438-2699

October 25-27, 1991
Annual Meeting
Canadian Association of Dental Consultants
Dr. W. Norgate, 901 St. Mary's Rd.
Winnipeg, MB R2M 3R4

November 23, 1991
Building a More Efficient Practice
New Brunswick Dental Society
(506) 452-8575

January 24-25, 1992
Manitoba Dental Association
(204) 453-0055

May 3-7, 1992
Les journées dentaires
(514) 875-8511

May 14-16, 1992
ODA Spring Meeting
(416) 922-3900

May 30, 1992
New Brunswick Dental Society
(506) 452-8575

February/Février 1992

February 12-16: Annual Convention of the Jamaica Dental Association in Ocho Rios, Jamaica. For further information on registration, contact: Dr. Keith Williams, Chairman, Convention Committee, 8 Melmac Ave, Kingston 5, Jamaica, WI. Tel: (809) 92-68209.

February 16-19: 127th Annual Midwinter Meeting of the Chicago Dental Society. Contact: Chicago Dental Society, 401 N. Michigan Ave, Suite 300, Chicago, IL 60611-4205, USA. Tel: (312) 836-7300. Fax: (312) 836-7337.

March/Mars 1992

March 8-12: The 15th Asian Pacific Dental Congress in Auckland, New Zealand. For registration forms, contact: New Zealand Dental Association, PO Box 28 084 Remuera, Auckland, New Zealand.

March 26-28: World Congress XII for Oral Implantology in Sydney, Australia. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

April/Avril 1992

April 6-11: 25th International Dental Show in Cologne, Germany. For information, contact: Verband der Deutschen Dental Industrie e.V., Pipinstrasse 16, W-5000 Köln 1, Germany.

April 8-12: XI International Conference on Oral and Maxillofacial Surgery in Buenos Aires, Argentina. For information and registration, contact the Secretariat at the following address: XI ICOMS, Casilla de Correo 4437, 1000 Correo Central, Argentina.

April 29–May 3: 8th Annual Scientific Sessions of the American Academy of Cosmetic Dentistry in Palm Springs, Calif. For more information, contact: Barbara Jo Zoelle, The American Academy of Cosmetic Dentistry, 2711 Marshall Ct, Madison WI 53705. Tel: (608) 238-6529.

October/Octobre 1991

October 2-5: American Academy of Periodontology. Contact: Barbara Mueller Connell, 211 E Chicago Ave, Suite 1400, Chicago, IL 60611, USA. (312) 787-5518.

October 3-5: American Academy of Gold Foil Operators in Vancouver, BC. Contact: Dr. T.E. Ramage (604) 873-5191.

October 4: 5th Annual Bernard Jankelson Memorial Lecture in Seattle, WA. For details contact: ICCMO International Headquarters, 830 Marsh & McLennan Bldg, Seattle WA 98101. Tel: (206) 623-8418.

October 7-13: Fédération Dentaire Internationale in Milan, Italy. For information, contact: Janice Edgar, c/o Canadian Dental Association, 1815 Alta Vista Dr, Ottawa, Ont. K1G 3Y6 (613) 523-1770.

October 9-13: American Society of Dentistry for Children. Contact: Carol Teuscher, 211 E Chicago Ave, Suite 1430, Chicago, IL 60611, USA. (312) 943-1244.

October 17-20: Annual Convention of the Canadian Pain Society in Vancouver. Contact: Kenneth D. Craig, Local Arrangements Committee, Dept of Psychology, University of British Columbia, 2136 West Mall, Vancouver, BC V6T 1Z4.

October 26-28: 17th General Meeting of the Japanese Association for Dental Science in Osaka. Contact: Japan Dental Association, 4-1-20 Kudan-kita, Chiyoda-ku, Tokyo 102, Japan.

November/Novembre 1991

November 27-30: XIIth International Dental Film and Video Festival in Paris. Enrolment deadline February 15, 1991. Enquiries: Dr. M. Dolovici, XIIèmes Journées 1991, 92 av. de Wagram, Paris, France. 33 1 42.27.89.00.

November 27-30: International Congress of the French Dental Association in Paris. For more information, write: ADF, 92, av Wagram, 75017 Paris, France.

November 30-December 5: Greater New York Dental Meeting in New York City. For details, contact: Greater New York Dental Meeting, 1700 Broadway, 4th floor, New York, NY 10019-5905. Tel: (212) 581-6611.

January/Janvier 1992

January 11-12: ACOI Winter Seminar: Live Implant Surgery Utilizing Blades in Phoenix, AZ. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

January 29–February 1: Miami Winter Meeting 1992 A Journey to Synergy at the Hyatt Regency Miami. For further information, call (305) 667-3647 or (305) 944-5668.

GENERAL DENTIST

Grenfell Regional Health Services invites applications for the positions of General Dentist on a full time basis for Northern Newfoundland and Labrador. This is a challenging and interesting area where dental services are provided for regional bases and travelling clinics.

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Interested applicants are asked to submit resumes along with names and addresses of references to:

Mr. Scott Smith
Personnel Director
Grenfell Regional Health Services
St. Anthony, Newfoundland
Canada A0K 4S0
Tele #: 709-454-3333, Ext. 349

Offices and Practices

YUKON—Whitehorse: Established and growing general practice with five nicely-equipped operatories. 1450 sq. ft. in professional building, newly-renovated and with favorable lease. Practise in a low stress setting with unmatched outdoor recreational opportunities. Owner wishes to stay for transition. For details, please phone (403) 668-6707 days or 668-2753 evenings.

(7-1/9)

BRITISH COLUMBIA—Kelowna: Large general dental practice in Canada's fastest-growing area. Ultra-modern office in medical dental building. High gross and very low shared overhead, three days a week. Sold with or without ski chalet at Big White Mountain. (604) 644-4348.

(9-3/9)

BRITISH COLUMBIA—Vancouver—North Delta: Well-established, eighteen-year-old general practice for sale in fast-growing residential-commercial suburb 30 minutes south of Vancouver. Front entrance location in medical-dental building. Space sharing arrangement in ten-chair office, totally renovated, Independent appraisal available. Please call (604) 594-2484 (O) or 531-7187 (H).

(9-5/9)

BRITISH COLUMBIA—Vancouver Island—Comox Valley: Very busy family practice — five operatories, 1400 sq. ft. Practice is located in a rapidly-growing community. Area offers excellent recreational opportunities. For more information, call (604) 338-0480.

(9-2/9)

BRITISH COLUMBIA: Vancouver, Burnaby. Practice for sale immediately. Vendor has other interests. Very low asking price when compared to earnings. For more information, phone (604) 420-9569 evenings.

(8-6/9)

ALBERTA: PRACTICE FOR SALE. Illness forces sale of this prime location practice 1 1/4 hours from Edmonton. Very high gross and low overhead. Offered at one year's net earnings. Financing or associate with option to purchase possible. Phone (403) 542-3756.

(8-8/1)

ALBERTA—Near Edmonton: High gross, high net practice for sale immediately. Fully equipped and modernized including Abel/Dyna computer system. Approximately 5000 active patients with high percentage having dental insurance. Realistically priced

with some owner financing possible. Phone (403) 481-2421

(6-2/11)

ALBERTA—Red Deer: Established, downtown practice with room to grow. Low overhead, low stress. Extremely reasonable price. Phone (403) 449-1746 after 6pm or weekends.

(8-13/9)

SASKATCHEWAN: Large rural practice for sale in progressive community. Modern three op layout with panorex, fully-staffed including therapist and hygienist. High yearly gross. Reduced price as owner is returning to grad school. Please reply to CDA Box 2483.

(3-21/13)

ONTARIO—Brampton: (1/2 hr from Toronto) Storefront practice for sale. Idea for Punjabi-speaking dentist. Approximately 50,000 East Indian population with about 45,000 Punjabi-speaking. Shared reception with busy medical office. Three operator facility with panorex, two ops equipped with Pelton & Crane equipment, new, 1986. Good gross. Asking \$135,000. Call confidentially (416) 454-2938.

(8-11/13)

Associateships Available

NWT—Yellowknife: Full-time associateship available immediately. Well-established, family-oriented practice. Excellent opportunity to deliver a full range of dental services in a modern fully-equipped office. Please reply to Dr. HAJ Biati, PO Box 1178, Yellowknife, NWT X1A 2N8.

(9-8/11)

BRITISH COLUMBIA—Vancouver East: WANTED A full-time associate immediately. Option to buy. Long-established, busy, central practice. Please call (604) 876-0712 days.

(8-2/9)

ALBERTA—Grande Prairie: Associate required immediately for busy practice. Opportunity for future partnership. Four fully-equipped ops expanding to six in September. Conditions negotiable. Call (403) 538-4050 (O) or (403) 539-3079 (H).

(8-1/1)

SASKATCHEWAN: Associate wanted for locum in rural practice. Family practice with new equipment and pleasant staff. Terms are negotiable. Please reply to CDA Box 2522.

(8-10/13)

QUÉBEC—Montréal: Dentiste recherche un associé potentiel avec orientation vers

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(7-5/9)

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(8-14/9)

ONTARIO: Registered dental hygienist required for a busy general practice during a maternity leave. Guaranteed four to five days a week. Excellent salary, friendly staff. Outdoor life style. New downhill ski hill, cross country skiing, curling, skating and indoor swimming pool. Position available October 1, 1991. Send resume or phone: Dr. Ness Amano, PO Box 1300, Marathon, Ont P0T 2T0 or call (807) 229-0144.

(8-4/9)

Opportunities Wanted

BRITISH COLUMBIA—Vancouver: UBC graduate Class of 1990. Female dentist available for full-time associateship or locum. Efficient and keen about her work. Now looking for position in lower mainland or GVRD. Please call (604) 733-4763 and leave message. Calls returned ASAP.

(9-4/9)

Opportunities Available

BRITISH COLUMBIA—Vancouver Island: Tired of the big city rat race? Why not consider the clean environment and relaxed lifestyle of British Columbia's west coast. An opportunity is offered for a pedodontist (Board certification not essential) to practise in a modern group

practice in Campbell River, BC. This family-oriented, four-season recreational paradise enjoys a thriving economy and rapid population growth and easy access to Vancouver and Victoria. You will have an instant practice with a low overhead and attractive potential for future practice development. For more information call Drs. Nugent or Watt at (604) 287-2141.

(8-12/9)

ALBERTA: For sale or associateship leading to purchase. Modern office, four operatories, with O.P. 10 pan/ceph unit. Full-time hygienist and rental space shared. Good gross, very reasonable selling price. Please call (403) 826-6130.

(3-9/13)

ONTARIO: PERIODONTIST Associateship/Partnership available. For more information, please contact (519) 439-0129.

(8-7/9)

ONTARIO—Guelph: (45 minutes to Toronto) Endodontist required full-time on cost sharing basis. Please call Dr. Cooperband at (519) 767-2886.

(9-6/11)

NORTHWESTERN ONTARIO: The town of Rainy River has a modern, fully-equipped, two-operatory dental clinic avail-

able immediately on a reasonable rental basis. A Ministry of Health underserved area grant is available to a dentist establishing a practice in Rainy River. For more information, please contact: Mr. Irwin Johnson, Clerk/Treasurer, Town of Rainy River, PO Box 488, Rainy River, Ont P0W 1L0. Tel: (807) 852-3244. Fax: (807) 852-3553.

(8-8/9)

Vacation Rentals

BRITISH COLUMBIA—Whistler: Quiet three-bedroom home adjacent to golf course in Whistler Cay. A 20-minute walk from Whistler Village on beautiful Valley Trail. Indoor jacuzzi, outdoor hot-tub, six appliances and sleeps eight to ten comfortably. Perfect vacation spot summer or winter. Available weekly. Please call Dr. Maria Corral or Don Henkelman at (604) 435-0680.

(7-11/12)

BRITISH COLUMBIA—Whistler—Blackcomb: Three-bedroom luxury condo, sleeps eight, walk to lifts. Contact (519) 886-8980 Dr. B. Clarke.

(9-7/12)

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Ultracaine® D-S D-S forte

(articaine hydrochloride with epinephrine)

Action

Ultracaine (articaine HCl) has been shown to block conduction by interfering with the process fundamental to the generation of the nerve action potential, namely the large transient increase in the permeability of the membrane to sodium ions that is produced by a slight depolarization of the membrane.

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Ultracaine is indicated for infiltration anesthesia and nerve block anesthesia in clinical dentistry.

Contraindications

Ultracaine is contraindicated in patients with a known hypersensitivity to local anesthetics of the amide group; in the presence of sepsis near the proposed injection site; in patients with severe shock; in patients with any degree of heart block; in patients with existing neurologic disease and in patients with severe hypertension.

When **Ultracaine** with epinephrine is used, the caution required of any vasopressor drug is in order.

Warnings

Methemoglobinemia

As with other local anesthetics, **Ultracaine** is capable of producing methemoglobinemia: this has been observed when an intravenous regional anesthesia technique is used. **Ultracaine**, when used as directed in dental procedures, was not associated with methemoglobinemia.

Usage in Pregnancy

Animal studies have not demonstrated teratogenic or embryotoxic effects of **Ultracaine**. However, safe use in pregnant women has not been established. **Ultracaine** is unlikely to be transferred to the mother's milk since it is rapidly decomposed and eliminated.

Precautions

Resuscitative equipment and drugs should be readily available when any local anesthetic is used. The safety and effectiveness of local anesthetics depend upon proper dosage, correct technique, adequate precautions and readiness for emergencies. **Ultracaine** should be used cautiously in persons with known drug allergies or sensitivities, or suspected sensitivity to the amide-type local anesthetics.

Patients with Special Diseases and Conditions

The p-hydroxybenzoic acid methyl ester contained in **Ultracaine**, as a preservative, has a hydroxy group in the para-position. This fact should be borne in mind in the case of patients with para-group allergy.

Adverse Reactions

Reactions to **Ultracaine** are characteristic of those associated with amide-type local anesthetics.

A major cause of adverse reactions to this group of drugs is excessive plasma levels, which may be due to overdosage, inadvertent intravascular injection, or slow metabolic degradation. Other causes of reactions to these local anesthetics may be hypersensitivity, idiosyncrasy, or diminished tolerance.

Dosage and Administration

As with all local anesthetics, the dosage varies and depends upon the area to be anesthetized, the vascularity of the tissues, the number of neuronal segments to be blocked, individual tolerance and the technique of anesthesia. The lowest dosage, needed to provide effective anesthesia should be administered.

	Infil- tration	Nerve Block	Oral Surgery
Ultracaine DS forte	0.5-2.5 mL	0.5-3.4 mL	1.0-5.1 mL
Ultracaine DS	0.5-2.5 mL	0.5-3.4 mL	1.0-5.1 mL

It is recommended not to exceed 7 mg/kg body weight in adults.

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References:

1. Dudkiewicz A, Schwartz S, Laliberté R: Effectiveness of Mandibular Infiltration in Children Using the Local Anesthetic Ultracaine®. *Canadian Dental Association Journal* 1987; Vol 53 (No. 1):29-31.
2. Lemay H et al: Ultracaine in conventional operative dentistry. *Journal of the Canadian Dental Association* 1984; 50 (No. 9):703-708.

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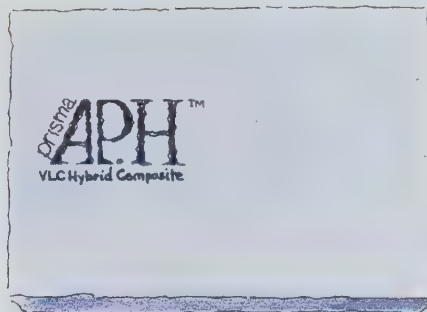


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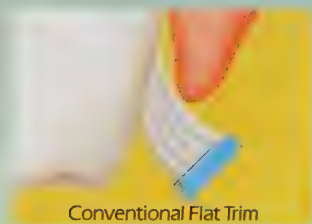
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Butler G·U·M4II

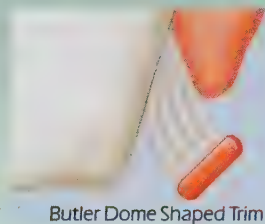
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Conventional Flat Trim



Butler Dome Shaped Trim

The bristles on the outside are shorter than the center ones, so that the longer center bristles can more easily reach the sulcus. They slip freely under gingival margins to clean where plaque build-up begins.

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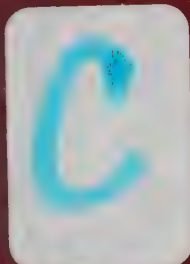


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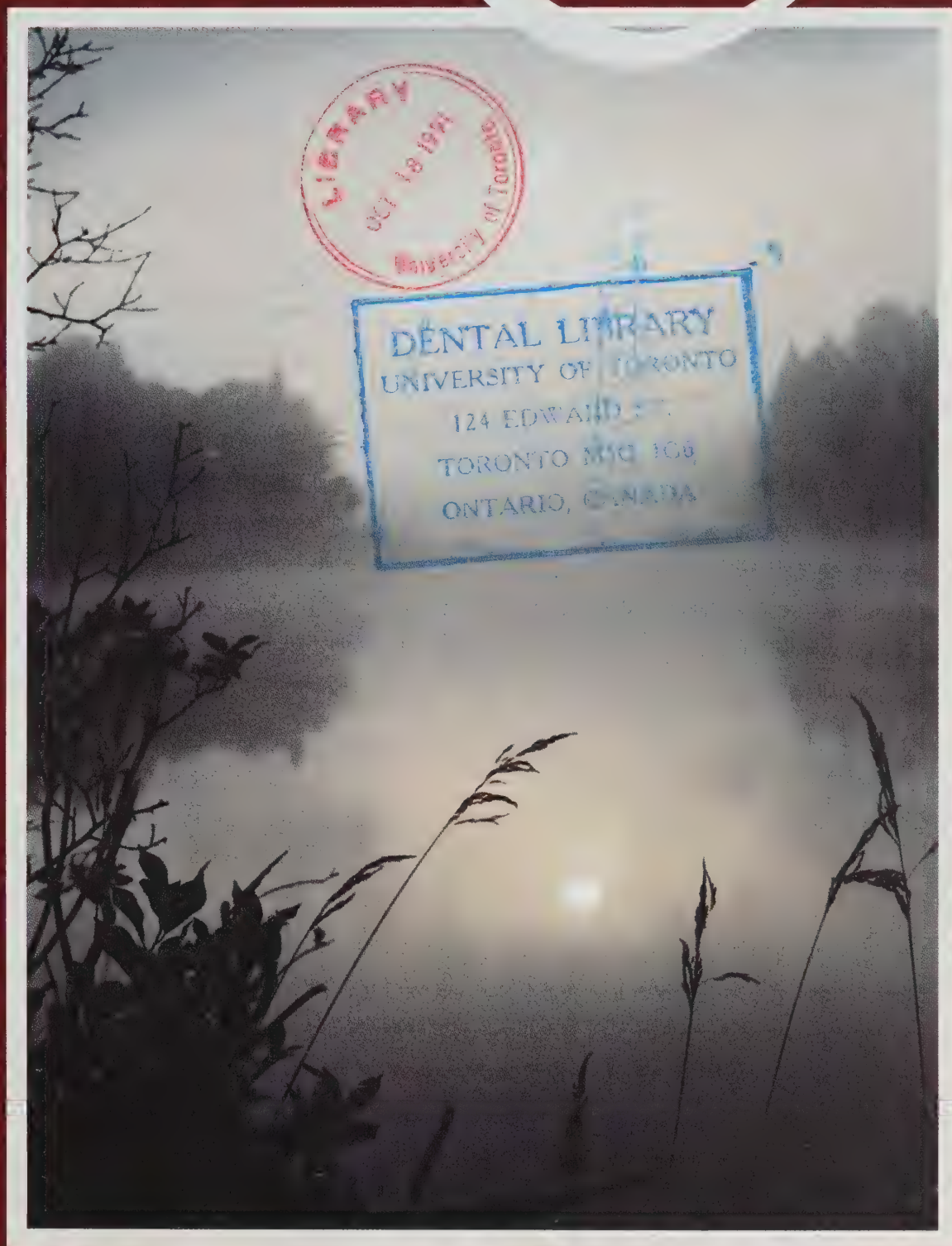
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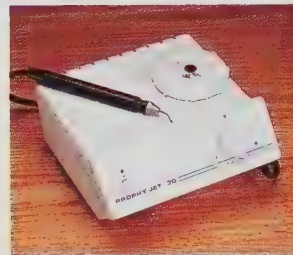
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October 1991

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JOURNAL

Canadian Dental Association L'Association dentaire canadienne

October 1991

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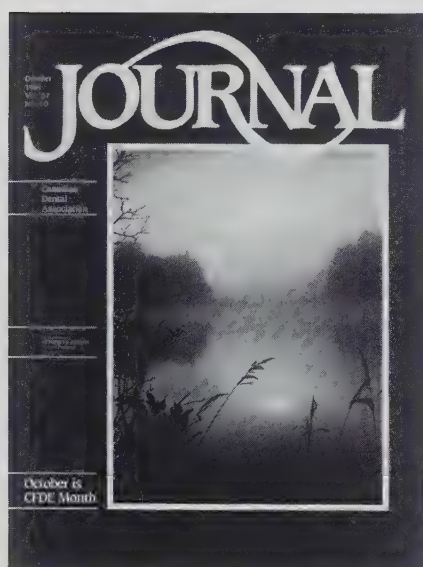
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The most acclaimed brush strokes since Van Gogh.

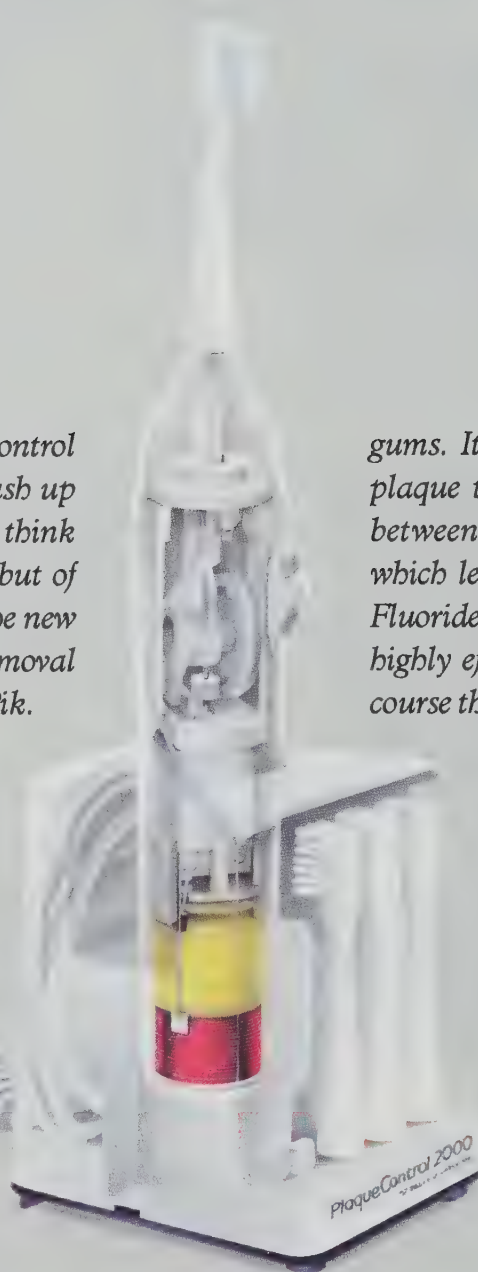
Before you recommend a plaque control program, we suggest that you brush up on a couple of facts: 76% of adults think they won't develop gum disease¹, but of all adults, 75% will². They need the new PlaqueControl 2000™ plaque removal instrument from Teledyne Water Pik.

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gums. It's clinically proven to remove the plaque that manual brushing can miss, between the teeth and at the gumline³, which leads to improved gingival health. Fluoride dentifrices have been shown to be highly effective in reducing cavities, so of course the PlaqueControl 2000 is designed

to use any dentifrice, without extra maintenance. Best of all, the PlaqueControl 2000 is made by Teledyne Water Pik, a trusted name in professional dental products. So next time you're recommending a plaque control program, consider our new PlaqueControl 2000.

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THE KEEPER OF THE SPRINGS

The story is told of a quiet little town nestled in the valley of a mountain range. A mountain stream was the "life" of the little town. Many people took the stream for granted. The children laughed and played on its banks, swans glided gracefully in its quiet pools. Fishermen always found a day's catch in its waters. And the mills turning the town's industries found power in the stream's steady flow.

High in the mountains toiled the Keeper of the Springs. His task was to keep the mountain springs that fed the stream free of dirt and debris, ensuring there was always a flow of pure, clear water. The Keeper went about his duties quietly — the people in the town didn't give him much thought.

One day, in the midst of a recession, the Keeper of the Purse said to the council, "Expenses must be cut. Let us dispense with the Keeper of the Springs — no one will ever miss him." And so the springs were left unattended.

Strange happenings soon overtook the quiet mountain town. The stream seemed to be slower, and it smelled a little strange. The children no longer enjoyed playing on its banks and the fish didn't bite any more. The swans flew away and didn't return. Factory production dropped — too much time was lost unclogging water wheels.

The Mayor sent a work crew to the mountain to investigate. The problem was evident. Branches, dirt, leaves and animals had clogged, slowed and diverted the life giving rivulets of pure, clean water that flowed from the springs.

Said the Mayor to the Keeper of the Purse, "This will never do. Our town cannot survive without pure water. Seek out the Keeper of the Springs and plead with him to return to his former tasks. We will find the funds — our town cannot live without his toil."

And so it came to pass. The Keeper of the Springs returned to the mountains and quietly kept the fresh water flowing. The swans returned; again the



Dr. P. Ralph Crawford

children laughed on the stream's banks. The fish became abundant and the factory wheels hummed.

This is membership time at the Canadian Dental Association. The time of year when CDA reminds everyone that it is the Keeper of the Springs in Canadian dentistry. CDA's mission as the authoritative national voice and resource for dentists must be sustained. CDA ensures that a steady, strong stream of dental information and

dentist services flow continuously throughout the year.

Without CDA, the national stream of communications would be clogged and unproductive. There would be no national perspectives on dental health promotion, infection control, media relations, financial and insurance packages, educational standards, government dialogue or convention meetings. The wheels of dental industry would clog and falter.

For dentists in the eight "mandatory" provinces, support for CDA is intrinsic with provincial association dues. You do not have to take pen in hand and make out a separate \$395 cheque to pay your 1992 CDA membership. Endorsement and support of your individual provincial association contributes to CDA's strength.

To the dentists in Ontario and Quebec — the provinces where the legislators, not dentists, prevent mandatory membership — a special appeal is directed your way each fall. As individuals, you are asked to make a private decision to be in or out of the mainstream of national dentistry.

Your CDA — The Keeper of the Springs of Canadian dentistry — is committed to giving far more value than it asks in return. CDA's value, as received by dentists from coast to coast, is an intangible and always will be. But, individually, can you conceive a dental world without a CDA?

P. Ralph Crawford, BA, DMD

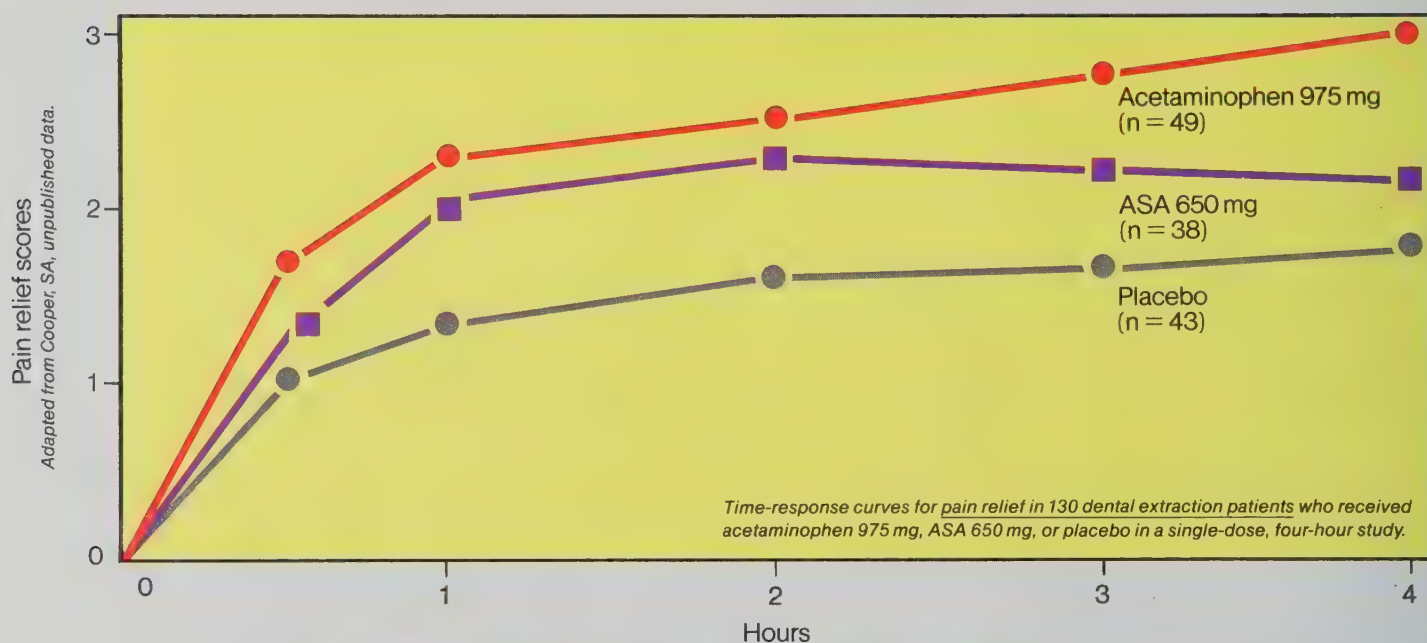
Editor: Journal of the Canadian Dental Association

YOU HAVE TO THINK ABOUT MUCH MORE THAN PAIN RELIEF WHEN YOU RECOMMEND AN ANALGESIC

With some of the many analgesic choices available, you need to address a lot of medical questions to make a responsible professional recommendation.

Is the patient asthmatic or sensitive to salicylates, prone to ulcers, taking potentially incompatible drugs? A "yes" to any of these questions would exclude any ASA or ASA-narcotic combination product as well as all NSAIDs. And, of course, if there is a risk of bleeding, they would also all be contraindicated because their antiplatelet activity could aggravate bleeding.

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President's Column

DOLLARS AND SENSE

Before my recent inauguration as president of CDA, I took a moment to reflect on my career in dentistry, and on what CDA has meant to me over the years.

It came to me, as I remembered the succession of events that have shaped my life, that I had never imagined, and couldn't imagine now, not being a member of CDA. Maybe it is because my father, also a dentist, has always being a strong supporter of the association. Or perhaps it stems from my childhood memories of caddying in the monthly dental golf tournaments in Winnipeg, or the fact that Manitoba was finally granted a dental college in 1958 — the first new Canadian dental school to open in 40 years. Then, it could be because many of my friends are now practising dentists and active CDA members.

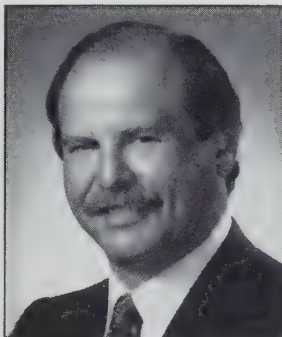
However, when all is said and done, the most important reason for my ongoing membership in CDA isn't nearly so complex. Quite simply, CDA is the national organization of my chosen profession. I have never weighed the merits of whether I should join CDA rather than my provincial association, or vice versa. The two organizations are very different, even though they must, and do, complement one another.

CDA's objective, which is put forward so well in the association's mission statement, is to be the authoritative national voice and resource organization for Canadian dentists. And from the time the association was founded 90 years ago, it has consistently achieved that objective, facing the issues of concern to organized dentistry in Canada head-on.

Recently, for example, CDA represented all Canadian dentists when it issued public statements on the safety of mercury amalgam. The association also took a leading role on the HIV-AIDS issue, by organizing and hosting a conference on the implications of the virus for the health-care provider. Equally important, the work of CDA's taxation committee on the GST, as it relates to organized dentistry, has become a bench mark in government-private sector relations. In fact, the GST manual that was developed by the committee is now a standard resource document in all government taxation offices.

CDA has been active behind the scenes, too. From day one, the association has developed national policies and guidelines for organized dentistry, giving direction and support to both dentists and the public. It has been an evolving organization, a trend setter that, 30 years ago, led the world in developing a list of codes and services for third party insurance claims, as well as the world's first standardized dental claim form.

Furthermore, it was CDA that first brought low-cost group insurance to its members. To this day, the economics, variety and availability of the association's insurance programs has made them the envy of many other dental associations, worldwide. And then there is CDAnet. When our United States counterparts learned



Les Allen

that CDA and its provincial corporate members had developed an electronic data interchange system for insurance claims, one that is owned and controlled by dentists for the benefit of dentists, they were not only laudatory but incredulous.

CDA's accreditation system, developed step by step over a quarter of a century, has assured Canadians that the training received by dental students in this country, in all aspects of dentistry, is among the finest in the world. And our national programs to promote fluoridation and

decay prevention have raised the quality of life for countless Canadians.

A year ago, CDA commissioned a national survey to sound out dentists on what they thought of their national association. The results were highly positive, with the vast majority of dentists responding "Yes" to questions such as: does CDA work for you?; is CDA responsive to the concerns of its members?; is CDA a good communicator? Many respondents to the survey also made it clear that they believe CDA is well-placed to tackle issues of national concern to dentists and urged the association to not only sustain and enhance its existing programs, but to initiate new ones.

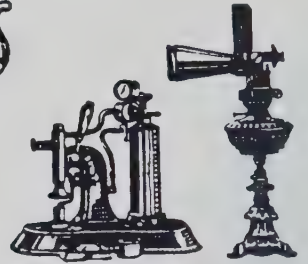
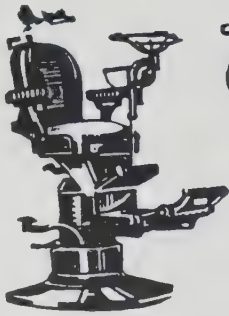
The support enjoyed by CDA today is reflected by the encouragement we continue to receive from dentists around the country, which is more visible now than ever before, and by their ongoing participation in association activities.

But activity and involvement must come with a price tag. The programs and initiatives CDA undertakes on behalf of Canada's dentists cannot be accomplished without adequate funding. Our Member Services program, which is absolutely vital to the success of a pro-active organization like CDA, costs \$1.5 million per year and includes the publication of the *Journal* and *Communiqué* as well as other communications-related materials.

Another \$400,000 of CDA's \$5-million annual budget goes to professional services, which include accreditation as well as maintaining the committees responsible for product recognition, materials, devices, community and institutional dentistry, ethics, specialties, and the DAT test, among others.

If dentists want to have a national voice that is heard, and to maintain the vital programs CDA has undertaken on their behalf, they should keep an old adage in mind: "There is no free lunch." Admittedly, it is easy for those of us who are intimately involved with CDA to evaluate the association's role and what it has achieved for organized dentistry. If you are not part of the process it will be more difficult for you to see the true value of CDA. Just remember that it is a matter of dollars and sense. CDA needs your support and you need CDA. Lets work together for the good of all Canadians.

Les Allen, B.Comm., DMD
President of the Canadian Dental Association



CDA MUSEUM

Donations Requested

With the CDA completion of its Ottawa headquarters expansion and renovation program last summer an area of the library has been set aside for a small museum. Memorabilia from CDA's 88 year history which had to be kept in storage due to lack of space has now been displayed in attractive new surroundings.

Plans are underway to have the museum "mobile". Displays will be changed on a regular basis to suitably depict different eras of our rich dental history.

Donations of museum quality dental artifacts would be much appreciated. Particularly requested are larger items such as dental chairs, units, cabinets and X-Ray machines. (More on page 758)

**For further information contact Dr. Ralph Crawford, CDA Ottawa,
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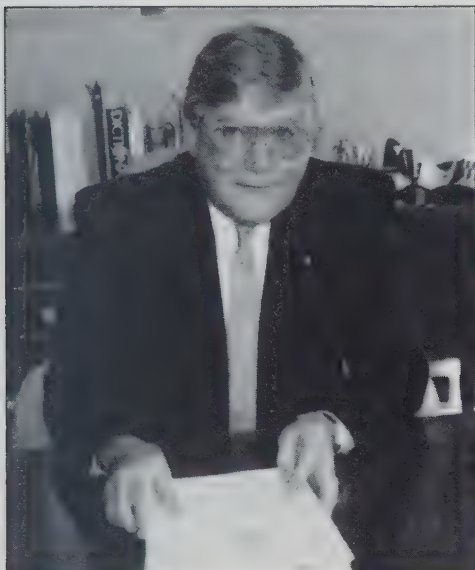
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CDA Executive Director Honored by ADA



Mr. Jardine Neilson

Mr. Jardine Neilson, CDA's executive director, was named to honorary membership in the American Dental Association (ADA) October 6, during ADA's annual meeting in Seattle, Washington.

In conferring the honor to Mr. Neilson on behalf of ADA's board of trustees, ADA president, Dr. Eugene Truono, said, "This award recognizes those individuals who have made outstanding contributions to the advancement of the art and science of dentistry."

Only six Canadians have been named to honorary membership in ADA — the association's highest honor — since the award was initiated in 1863: Dr. Frank Woodbury, 1899; Dr. Don Gullett, 1956; Dr. Harvey Reid, 1962; Dr. Bill McIntosh, 1967; and Dr. George Beagrie and Mr. William Benson, 1990.

Mr. Neilson was born in Verdun, Quebec, and holds a bachelor of arts degree from Sir George Williams University in Montreal and a master of social work degree from McGill University. He was appointed CDA executive director in 1985 following a distinguished 21-year career with the Government of Canada.

At CDA, Mr. Neilson has been particularly effective in cementing relations between the national and international dental community. A regular participant at the annual Fédération Dentaire Internationale (FDI) congress, he served on the 1988 search committee for the appointment of a new FDI executive director, and participated in, as well as hosted, the

working group established in 1989 to develop the mission statement and goals of FDI.

Toronto Grad Receives \$2,000 Research Award



Dean Barry Sessle, faculty of dentistry, University of Toronto, accepts the Canadian Dental Research Foundation Award and trophy on behalf of Dr. Gregory Michael Murray, the 1991 winner. Presenting the award is CDA past-president, Dr. Gilles Dubé.

Dr. Gregory Michael Murray has won the 1991 Canadian Dental Research Foundation (CDRF) Award, valued at \$2,000.

An Australian with an undergraduate degree from the University of Sydney, Dr. Murray received the prestigious CDRF Award for his research paper on "The Effects of Reversible Inactivation of the Primate Face Motor Cortex on Tongue Protrusion and Biting." Dr. Murray conducted his research while pursuing his PhD at the University of Toronto.

Dr. Barry Sessle, Dr. Murray's research supervisor and the dean of the faculty of dentistry at U of T, accepted the CDRF trophy for Dr. Murray, who has returned to Australia. He is now with the department of prosthodontic dentistry at the University of Sydney.

The Canadian Dental Research Foundation was founded in 1920 as a memorial fund for those dentists who served in the First World War. The fund's original purpose is as valid today as it was 70 years ago: **To carry on among the dental association and the dental colleges of Canada an intensive study of perplexing problems which confront the dental**

profession, and to investigate, scientifically, current methods in dental practice.

The CDRF Award, currently presented every two years, is administered by CDA's committee on dental materials and devices on behalf of the executive council. This year, 12 applications were received and reviewed.

Abstract, 1991 CDRF Award Winning Paper

"Effects of Reversible Inactivation of the Primate Face Motor Cortex on Tongue Protrusion and Biting"

by Dr. Gregory Michael Murray

There is little information on the motor cortical mechanisms controlling tongue and jaw movements. An investigation was conducted in two awake monkeys to study (a) the effects of reversible inactivation of the face motor cortex on performances of a tongue-protrusion task and biting task, and (b) single-neuronal activity in face motor cortex during these same two tasks.

Bilateral cooling of the face motor cortex significantly impaired the performances of the tongue-protrusion task, whereas only more subtle effects were noted on biting task performance.

At sites from which intracortical microstimulation (ICMS) evoked tongue-twitch movements (tongue-MI sites), a significantly higher proportion of neurones altered their firing rates during the tongue-protrusion task than the biting task. Five patterns of neuronal activity were characterized for tongue-MI neurones during the tongue task. At sites from which ICMS evoked jaw movements (jaw-MI sites), a significantly higher proportion of neurones altered their firing rates during the biting task than the tongue task. Most task-related neurones exhibited preferential relations for only one of the tasks. A prominent mechanosensory afferent input was identified for task-related tongue-MI and jaw-MI neurones.

At different sites within tongue-MI, ICMS evoked four categories of elemental tongue movement; tongue-task-related neurones were found at each ICMS-defined category of site. At these different tongue-MI sites, the firing rates of some neurones varied with the direction of tongue protrusion. These data suggest that different tongue-MI sites may be recruited differentially to effect the appropriate change in tongue shape and position during tongue protrusion.

These findings indicate a critical role for face motor cortex in the generation and control of tongue movements; although the data point to an important role for face motor cortex in the control of jaw-closing movements, another part of the central nervous system may be important in the generation of jaw-closing movements.

Consumer report says “Amalgam fillings are still best bet”

An article published in the May 1991 issue of *Consumer Reports*, which reviewed the amalgam controversy resulting from the broadcast of a segment on dental amalgam by “60 Minutes” last December, has come out in support of amalgam.

“CU’s (Consumers Union of U.S. Inc.) dental advisors believe that, at present, the alternatives (to amalgam) don’t measure up. Given their solid track record and a risk that’s still conjecture, amalgam fillings are still your bet,” said the article’s authors.

Running under the heading, “The Mercury In Your Mouth,” the article gave an excellent overview of mercury toxicity and amalgam, which is used in over 100-million dental fillings a year, on average. It made reference to the studies Dr. Murray Vimy undertook in Calgary, where 12 amalgam fillings were placed in six sheep. Vimy’s report on the subsequent damage to the sheep’s kidneys has been criticized by other eminent scientists, who dispute the efficacy of using sheep to determine the mercury toxicity of amalgam. In addition, the article cited a Swedish study that showed that the prevalence of 30 symptoms often claimed to reflect the toxic effects of amalgam — including fatigue, dizziness, irritability and back pain — were no more likely to occur in people with 20 fillings than they were in those with few or no fillings.

Another study outlined in the article described data obtained from 30,000 female dental assistants and the wives of 29,000 dentists, who were divided into groups based on high and low amalgam exposure levels. No difference in the incidence of miscarriage or birth defects of offspring was found between the two groups.

The article also made reference to the standards set by the Occupational Safety and Health Administration (OSHA) in the United States. Under OSHA guidelines the maximum “safe” occupational dose of mercury vapor is about 300 to 500 micrograms per day, depending on the recipient’s level of physical activity. However, even people with a moderate to large num-

ber of amalgam fillings in their teeth are exposed to only one to three micrograms of mercury vapor daily, or barely one per cent of the maximum safe dose.

Consumer Reports, in the article, deals fairly with the incidence of anecdotal evidence, quoting Dr. Richard Malvin, a University of Michigan specialist in renal physiology, who says, “Ten anecdotes don’t make one good experiment. Throughout history people have tried terrible “cures” based on anecdote, from laetrile to bee stings.”

The article cautions readers that the apparently positive response by some patients to the removal of their amalgam fillings may actually be the result of a placebo effect or a spontaneous improvement in the course of the disease — both of which are common in multiple sclerosis and rheumatoid arthritis.

Although amalgam opponents state that any uncertainty over the mercury toxicity of amalgam is an unacceptable risk, this risk has to be measured against the alternatives to the use of dental amalgam. In seeking an alternative, the *Consumer Reports* article uses an easy to read chart to compare the cost, durability, and color of amalgam, composite, ceramic and gold, as well as the risk of tooth fracture and recurrent decay inherent in the use of these materials.

“Amalgam has held sway for more than a century,” the article states, “because it’s strong and durable, able to withstand the tremendous pressures of chewing and grinding. It’s also easy to place, relatively

inexpensive, and has properties that protect against further decay.”

(Reprints of the *Consumer Reports* May 1991 article, “The Mercury in Your Mouth,” are available in bulk quantity. For information and prices, write CU Reprints Dept., 101 Truman Ave., Yonkers, N.Y. 10703-1057)

Poster Contest Winners

Winners of the nationwide Dental Health Month Poster Contest were selected recently by a panel of judges from the CDA executive. The contest is organized by Canada’s provincial dental associations each April in conjunction with National Dental Health Month.

This year, entries were received from seven provinces: Alberta, British Columbia, Saskatchewan, Manitoba, Ontario, Nova Scotia and Prince Edward Island. The winners are:

- ** **Category A, Kindergarten to grade 1:** Angie Baydack, 6, Grade 1 — Samuel Burland School, Manitoba.
- ** **Category B, Grades 2 and 3:** Melissa Boehm, 9, Grade 3 — Dr. Brass School, Saskatchewan.
- ** **Category C, Grades 4 and 5:** Courtenay Hacault, 11, Grade 5 — Ste. Marie School, Manitoba.
- ** **Category D, Grades 6 and 7:** Joe Kozenko, 13, Grade 7 — St. Louis High School, Saskatchewan.

Each winner was presented with a framed certificate of congratulations, and each member of their class received a Live Bob “Keep Smiling” T-Shirt.

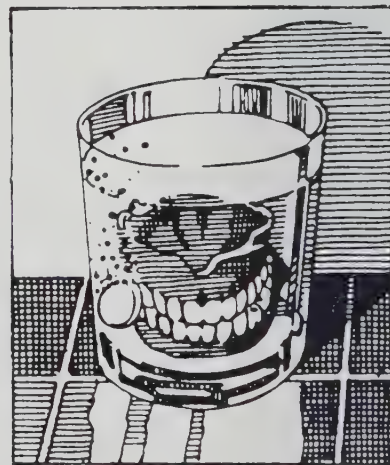
Did you know?

Woman’s Search for Dentures Trashed

Sandy Lifsey of Baltimore suffered a double indignity. Not only did she misplace her upper denture but when she went looking for it she had garbage dumped on her.

Lifsey, age 29, thought she had accidentally thrown her denture out with the dinner leftovers and went looking for it in the trash chute of her 11th floor apartment. She leaned too far and fell in. Her cries for help prompted a friend to call 911 and the fire department hastened to extricate the poor woman. In the meantime, apartment dwellers on upper floors, unaware of Lifsey’s plight continued to shower garbage on head.

She was rescued uninjured but never did find her upper denture.



October is CFDE Month A Message from a Friend

by Dr. Nicholas A. Mancini

Dear Friend:

The board of trustees of the Canadian Fund for Dental Education (CFDE) recently asked me to assist in its October 1991 campaign by writing this appeal to you.

'Why not?', I thought. Here's an organization that has been around for a long time and has done a lot to promote dental awareness and education in Canada. In fact, as dentistry's own "United Way," CFDE is directly responsible for supporting many programs that would never have got off the ground without the fund's help.

Leaders in our profession, along with key people in dental education and industry, established CFDE in 1962 to focus attention on the pressing needs of dental awareness and education, and to serve as a medium through which contributors could make regular donations to assist all areas of dentistry.

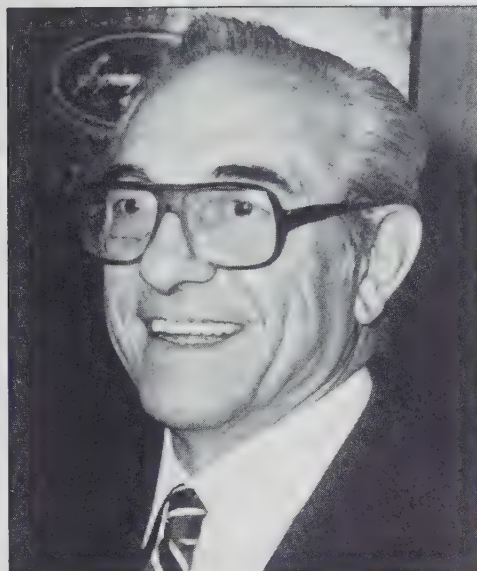
In speaking with the CFDE trustees, I learned that over the past 29 years **CFDE has contributed more than \$3 million to dentistry**. Among the many projects assisted: \$312,000 supported research, teaching and preventive dentistry conferences; \$220,000 has been granted to various dental awareness programs; \$210,000 has sponsored summer programs to improve the skills of dental faculty members within our Canadian universities; \$117,000 has assisted various special research projects; more than \$1,000,000 has provided teacher training fellowships; and, throughout the years, \$161,000 has gone to various programs, workshops and conferences to benefit allied dental health professionals.

So you can see that dentistry would not be what it is today were it not for the Canadian Fund for Dental Education.

I ask you, why then, do **only seven per cent of the 15,000 dentists in Canada contribute to CFDE?** As professionals, directly responsible for providing excellence in dental health care for all Canadians, we owe it to ourselves to support our own fund. CFDE represents **ALL** Canadian dentists, but unfortunately only a small and dedicated number of us are involved.

Just think how much more could be accomplished if every dentist sent an annual contribution — large or small.

The importance of education, prevention and research in the development of good dental health cannot be overemphasized.



Dr. Nick Mancini

Financial assistance to dental awareness and education is one of the keys to better dental health for all Canadians.

In order to better understand and follow the direction **YOU** want the fund to take, this year the CFDE trustees will be including a survey form in the package that the fund will be mailing to dentists in October. Please, take the time to complete and return this form to the fund.

CFDE Needs Your Input to Guide Us into the Future

As a strong believer in the work of CFDE, nothing would make me happier than to learn that my appeal to you, as a colleague and a friend, has made a difference in the future of dentistry.

I BELIEVE WE CAN DO BETTER THAN SEVEN PER CENT!

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All gifts are tax deductible, and donations of \$50 or more are acknowledged in the fund's Annual Report and Honor Roll. Contributors of \$100 are recognized as members; those who give \$200 as honor members; and those who give \$300 or more as patrons. △

CFDE Out-going Chairman Receives Award

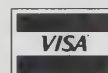


In appreciation for his many years of service to the Canadian Fund for Dental Education, particularly during his three years as chairman, Dr. Gordon Thompson (right) presents Dr. Ted Ramage, out-going chairman (left), with a plaque on behalf of the CFDE board of trustees. Dr. Thompson will be commencing his two-year term as CFDE chairman effective October 1, 1991.



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AIDS Information Available

Papers delivered by the key-note speakers on the first day of the CDA-sponsored conference on "The Impact of HIV and Other Infectious Agents on Oral Health Care" are now available from the CDA library.

The papers — *Epidemiological Perspective*, Dr. Joel Epstein, Dr. Rick Mathias; *Educational Perspective*, Dr. Henry Dick; *Licensing Body Perspective*, Dr. George Peacock; *Insurance Perspective*, Mr. Kingsley Butler; and *Ethical Perspective*, Dr. Gary Chiodo — can be purchased for a small fee.

One package of the six papers is available for \$3 to all CDA members and for \$6 to non-members, plus GST. (Ontario residents must also include the eight per cent provincial sales tax). To order, call 1-800-267-6354 from western Canada and area code 709, or 1-800-267-6364 from eastern Canada, except for area code 709.

Infection Control Resources Available

Canadian Public Health Association Resource Manual for AIDS Educators

A new resource manual for AIDS educators has been produced by the Canadian Public Health Association (CPHA). The manual, which offers practical assistance on the day-to-day obstacles encountered in AIDS education, was developed after a comprehensive survey of the needs of AIDS educators from coast-to-coast.

The new manual, the first of its kind in Canada, is designed specifically for people already acquainted with the basics of AIDS education. Fifteen learning activities, on topics ranging from personalizing HIV and AIDS to safe sex, provide educators with the information they need to set up and manage successful educational sessions.

A *Resource Manual for AIDS Educators* is available free of charge from the Canadian Public Health Association, National AIDS Clearinghouse, Suite 400, 1565 Carling Avenue, Ottawa, Ontario K1Z 8R1, or by calling (613) 725-3769.

In addition, a **Video for students in the health professions**, which stresses the AIDS and hepatitis risk faced by students in the health professions, is available from Novela Health Education, a non-profit organization based in Stamford, Connecticut.

Called *Learning Health Care in the Age of AIDS*, the 18-minute video stresses three of the most important AIDS issues

faced by students during their training years: how they can protect themselves, how they can protect others and what they should do if they have an exposure.

The film shows how students from medicine, dentistry, nursing and medical technology can reduce their occupational risk of contracting HIV while still delivering compassionate patient care. It teaches students to avoid placing others at risk through careless behavior, as well as the need for immediate reporting of an occupational exposure.

The video was initiated by the Oregon Health Sciences University in cooperation with the University of Washington AIDS Training Program and Novela Health Education. A 35-page training manual and poster accompanies the video. Cost of the program is \$250 U.S. and a preview is available for \$25, which can be applied to the purchase fee. For information, call Lisa Linzer at 203-968-0800 or 203-322-2788.

Dr. Mel Schwartz — A/O President

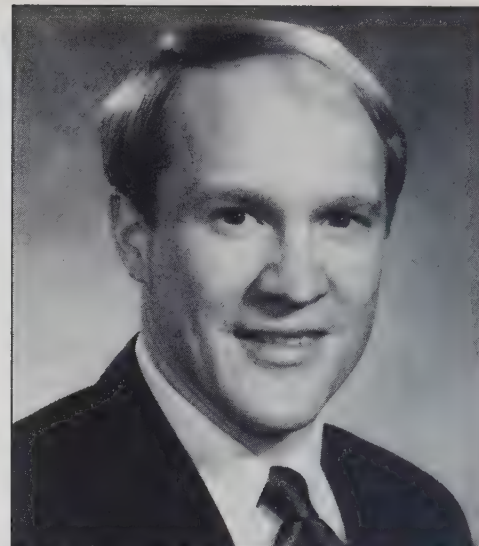


Dr. Mel Schwartz

Dr. Mel Schwartz of Montreal was recently elected president of the Alpha Omega Mount Royal Dental Society for the 1991-92 term. Dr. Schwartz received his DDS from McGill University in 1977 and completed a multi-disciplinary residency program at St. Mary's Hospital in 1979. He remained at St. Mary's as the coordinator of the dental residency program until 1983, when he assumed the position of associated director of the department of dentistry at the SMBD Jewish General Hospital.

Kodak Names Marketing Manager

Eastman Kodak Company recently named Mr. Leigh Harrington as manager,



Mr. Leigh Harrington

U.S. and Canadian marketing, for its Dental Products Group. In his new position, Mr. Harrington will be responsible for all advertising, promotion, marketing and technical support for Kodak Dental Products.

Mr. Harrington, who holds an MBA from the University of Rochester, brings over nine years of sales and managerial experience to Kodak's Dental Products Group. In his most recent position, director of contract administration for the Kodak Health Science Division, he managed programs and promotions for Kodak's health and medical segment.

CDA Museum

The CDA dental museum, located in the association's headquarters building in Ottawa, continues to seek and collect antique dental equipment and memorabilia. Anyone wishing to donate or loan material is asked to contact Dr. Ralph Crawford, *Journal* Editor. Call toll free, 1-800-267-6364 in the east, except area code 709, or 1-800-267-6354 in the west and area code 709.

Special thanks to those who recently contributed to our rich dental history: Dr. Bernard Tonchin, Montreal (X-ray machine); Dr. John Robertson, P.E.I. (crown swaging kit, transillumination kit); Dr. Brian Barrett, P.E.I. (instrument carrying case); Dr. Michael Connolly, P.E.I. (dental lathe, denture press); Dr. Jim Brookfield, Kirkland Lake, Ontario (pulp tester); Dr. George Allison, Hanover, Ontario (turbo-jet dental engine, swaging plate, and books).

"The Silver-Mercury Connection" — A Report

Last May, Dr. Hal Huggins, of the Huggins Diagnostic Center in Colorado Springs, presented a three-day seminar on



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DENTAL PRODUCTS GROUP

the treatment of chronic degenerative conditions.

Held in Vancouver, the seminar, called "The Silver Mercury Connection — A Multi-disciplinary Approach," was billed as a means by which health-care professionals could acquire state of the art knowledge to help patients suffering from these diseases.

As the front page of the seminar program included a statement, taken out of context, made by the CDA board of governors in 1986, and as the seminar material claimed that the causes of the degenerative diseases in question could be related to dental materials, the *Journal of the Canadian Dental Association*, in cooperation with the College of Dental Surgeons of British Columbia, arranged for an unbiased dentist to attend Dr. Huggins' seminar. A summary of the seminar, which was provided by this dentist, follows. . .

Approximately 20 people attended the seminar, which cost \$275. These included two chiropractors, two physicians, two nutritional consultants, a naturopathic practitioner, a massage therapist, the author of a health-related book, a "mercury sufferer," two or three course organizers and nine or ten dentists.

Dr. Huggins informed his audience that mercury toxicity causes interference with cell membrane permeability, the digestion and absorption of nutrients, nerve impulse transmission, endocrine function, enzyme and CNS activity and DNA replication.

He cited several case reports where miraculous "recoveries" were achieved through the removal of mercury-amalgam dental fillings. One of these reports examined the case of 15-year-old who was so weak that he had to remain in bed five days a week. The patient had only one pit amalgam filling. Yet, according to Huggins, when the amalgam was removed from the boy's tooth a complete recovery was achieved, and the patient subsequently climbed the Grand Canyon.

Another case report detailed the situation of a young girl suffering from crippling chest pains two or three times a day. The patient had six small occlusal amalgams. Upon removal of the fillings, says the report, the pains disappeared.

In fact, Dr. Huggins reported a 90 per cent success rate in relieving the symptoms of Lou Gehrig's disease, lupus, multiple sclerosis, Alzheimers, muscular dystrophy, leukemia, severe allergies, arthritis, myopia, astigmatism, heart disease and other auto-immune diseases — **after silver-mercury replacement.**

Dr. Huggins treats his patients with a multi-disciplinary approach. The first phase involves a complete examination of

the patient's problems and expectations (always a good start). Blood and hair samples are analyzed, then the patient's diet is manipulated until his or her blood chemistry is optimum.

Each patient is placed on a diet consisting of two eggs and a quarter pound of butter a day — 40 per cent of the total caloric intake consists of fat. Dr. Huggins admits that he has never been able to balance the blood chemistry of a vegetarian, and rules out the consumption of fish due to its high mercury content.

It is also recommended that patients drink Huggins' "Jogger Juice," which is sold as a "delicious state-of-the-art electrolyte replacement beverage in a balanced matrix" and comes in three "delicious" flavours.

The patients' nutrition is monitored carefully throughout their treatment, and supplementation is used extensively. Dr. Huggins markets at least 21 different "Matrix Minerals" to balance blood chemistries.

In the dental restorative phase, Dr. Huggins removes amalgams a quadrant at a time, starting with the quadrant which has the highest "negative current" fillings. This current can be measured on a specialized voltmeter available from Dr. Huggins.

Dr. Huggins has a special operatory prepared for amalgam removal, which he calls the "bubble operatory." This operatory has separate heating and air conditioning, as well as curved walls to facilitate circulation. Filtered air is electrically charged before entering the area.

Patients are tested for allergies to over 200 dental materials before any replacement restorations are considered. Usually gold or composite restorations are the materials of choice. Gold is recommended for all fixed bridgework and removable partial dentures. Huggins believes that frameworks made from nickel alloys are carcinogenic and electronegative, and says that patients complain of excessive salivation and discomfort when these devices are used.

Dr. Huggins also advocates the **removal** of all endodontically treated teeth. He believes these teeth release a toxin which is even worse than mercury. In fact, according to Dr. Huggins, root canal treated teeth are related to heart and kidney disease.

When Dr. Huggins was asked for data or studies to support his statements, he replied that scientific methods cannot always be relied upon. He cited two examples in support of this claim: cigarette smoking has never been proven to cause lung cancer and the HIV virus has never been proven to cause AIDS. He then sup-

ported his own theories with numerous anecdotal examples, which he defended vigorously. Δ

Obituaries/Nécrologie

Bardecki, S.A.: Dr. Bardecki graduated from the University of Montreal faculty of dentistry in 1955. He practised dentistry in Montreal.

Béliveau, R.: Diplômé de la Faculté de médecine dentaire de l'Université de Montréal en 1966, le Dr Béliveau exerçait sa profession à Sorel, Québec.

Best, K.A.: Dr. Best was born in Trinidad, W.I., and graduated in 1952 from the Meharry Medical College of Dentistry. He practised dentistry in Etobicoke. He died July 12, 1991.

Binette, G.: Diplômé de la Faculté de médecine dentaire de l'Université de Montréal en 1976, le Dr Binette exerçait sa profession à Longueuil.

Fleming, J.D.H.: Dr. Fleming was a graduate of the faculty of dentistry at the University of Toronto in 1939. He practised dentistry for over 45 years in Dundas, Ontario, where he was very active in his community.

Gordon, Z.M.: Dr. Gordon was a graduate of the faculty of dentistry at the University of Toronto in 1962.

Humphrey, E.R.: Dr. Humphrey graduated from the faculty of dentistry at the University of Toronto in 1938. He was a life member of the Canadian Dental Association.

Leblanc, I.: Diplômée de la Faculté de médecine dentaire de l'Université de Montréal en 1933, le Dr Leblanc exerçait sa profession à Montréal. Elle était membre permanente de l'Association dentaire canadienne.

McConchie, J.M.: Dr. McConchie graduated from the University of Toronto faculty of dentistry in 1944. He was a life member of the Canadian Dental Association.

Pelletier, L. Diplômé de la Faculté de médecine dentaire de l'Université de Montréal en 1932, le Dr Pelletier exerçait sa profession à Rivière du Loup, Québec. Il était membre permanent de l'Association dentaire canadienne.

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7. Domenic Morielli – “Le généraliste et les dents incluses : sélection de cas pour éviter les désastres”	08/26	_____	\$20.00
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9. Philip Molloy – “Endodontic First Aid”	08/26 (pm)	_____	\$20.00
10. Kenneth Shay – “Dental Management of the Frail Older Patient”	08/26 (pm)	_____	\$20.00
11. Gérard Bouger – “Le marketing au service du cabinet dentaire”	08/26	_____	\$20.00
12. Barbara Steinberg – “Dental Considerations for the Female Patient”	08/26	_____	\$20.00
13. Sebastien Ciancio – “Perio-chemotherapeutics”	08/27 (am)	_____	\$20.00
14. Philip Molloy – “Exploring Periapical Surgical Approaches”	08/27	_____	\$20.00
15. Barbara Steinberg – “A Team Approach to Treating the Dental Patient with Medical Problems”	08/27	_____	\$20.00
16. Dennis Smith – “Update on Bonding and Cements”	08/27	_____	\$20.00
17. Sol Silverman Jr. – “Update on AIDS, HIV Infection and Dentistry”	08/27	_____	\$20.00
18. Sebastien Ciancio – “Dento-therapeutics”	08/27 (pm)	_____	\$20.00
19. Sylvie Morin – “La restauration des dents postérieurs en dentisterie opératoire”	08/27	_____	\$20.00

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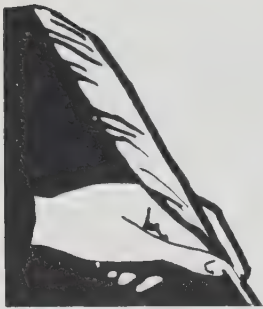
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Pour commander la *vidéocassette* du cours pratique du Dr Torsten Jemt en anglais, prière d'envoyer un chèque de 40 \$ à l'attention de Janice Edgar, Service des congrès, 1815 promenade Alta Vista, Ottawa, Ontario, K1G 3Y6



Dental Assistants Excluded

I am appalled by the insensitivity of CDA and Bausch and Lomb. CDA has always professed to believe in the dental team. Contrary to this, the rules of the CDA/Bausch and Lomb Dental Pentathlon Sweepstakes specifically exclude dental assistants from participating in the contest, thereby labelling the dental assistant as a nonessential part of the dental team.

Although the dental assistant does not produce the almighty dollar, he or she is nevertheless an integral part of the dental team and should be recognized as such.

CDA, you should be ashamed of yourselves for allowing this. You have let us down.

*Diane Pike, PDA
CDAA Journal Editor
CDAA Past President*

Past-President's Response

I apologize for any misunderstanding that has arisen as a result of the CDA/Bausch and Lomb Dental Pentathlon. I assure you, CDA believes in the concept of the dental team and in no way was the role of the dental assistant overlooked.

When this health promotion was originally conceived, the trip for two to the Winter Olympics in Albertville, France, was to be a "fellowship" with the Bausch & Lomb Dental Centre, which would be located on-site at the Olympic Games. This centre was to be staffed with dental professionals from many countries around the world. However, because the roles of dental care professionals vary substantially from country to country, Bausch & Lomb International made the decision to offer the fellowship only to dentists and hygienists. (In some countries, dental assistants do not exist, or if they do, the role they play in the dental office is not comparable to the role they play in the Canadian dental office.)

When printed materials for the pentathlon were being developed, Bausch & Lomb International vacillated between the

setting up the Olympic Dental Centre and dispensing with the whole concept. As a result, we removed the line that explained the fellowship from our materials (for fear that the centre was being cancelled), and decided that when Bausch & Lomb International took its decision, we could inform participating dentists and hygienists accordingly.

At the time, CDA was concerned about the fact that the fellowship would not be available to dental assistants, and this concern was voiced. However, the decision on eligibility for the fellowship was made by Bausch & Lomb International, and it was based on reasoned international criterion.

It should be noted that when CDA and Bausch & Lomb Canada had control over the distribution of prizes (i.e., the Ray Ban sun-glasses and the Olympic tracksuits), all members of the dental team were deemed eligible. We value the role that the dental assistant plays in the dental office very highly and it is distressing that we would be perceived to the contrary.

We hope that you are still able to share the excitement for the enormous potential of the dental pentathlon, and its ability to reach Canadians with dental health information. If CDA had possessed the power to include dental assistants in the grand prize competition, it would have acted accordingly.

*Gilles Dubé, DMD, M.Sc., Adm. Santé
Past-President*



Biocompatibility

Congratulations to Dr. Ivan Stangel for his in-depth research of present and future operative materials and techniques (Current Research in Operative Materials and Techniques and its Future Impact, *CDA Journal*, July 1991). I believe it is important, however, that the conclusion of his biocompatibility section stand corrected in a publication as widely read as the *CDA Journal*.

The biocompatibility of dental materials, and of mercury amalgam in particular, is a medical issue, not a dental issue. Most dental researchers (like Dr. Mackert) and dental publications (like the *CDA Journal*) have come out in favor of the continued safe use of amalgam based on some scientific but mainly clinical evidence.

Research studies investigating medical physiologic effects, if conducted by dentists, should — but very seldom do — include medical scientists.

Perhaps the dentists who are now judging medical conditions are venturing beyond the scope of their qualifications, scientifically if not legally. It has now been scientifically established by the World Health Organization (WHO) that patients are chronically exposed to mercury from dental amalgam fillings and that the exposure is not insignificant compared to dietary intake of mercury.¹

In the future, valid investigation of possible pathophysiologic effects of this exposure should be determined by qualified medical scientists, not dentists.

Since there is a widening schism between the findings reported by medical scientists and those reported by dentists on mercury amalgam safety, Dr. Stangel could have concluded his biocompatibility section by stating that: "After 150 years of excellent clinical service and apparent safe use, dental researchers will now cooperate with medical scientists in determining the possible pathophysiologic effects of mercury leaching out of amalgam and advise the dental profession appropriately as to the continued use of this material."

Pierre Larose, DDS, FAGD

Reference

1. Environmental Health Criteria 118: Inorganic mercury. WHO, Geneva, 1991.

Dr. Stangel's Response

Dr. Larose's letter makes several points which are misconstrued and require clarification. The biocompatibility of dental materials, even composite resins, along with amalgam, is neither a medical or dental issue but a health issue. After all, dentistry, along with medicine, is in the business of providing and maintaining the health of individuals. Furthermore, neither should do harm. Thus, the safety of amalgam falls within the domain of health science, of which dentistry is a part.

Dr. Larose further misunderstands the nature of scientific investigation. It is a well thought out, well-planned, rigorous and systematic method of testing hypotheses and answering questions of research importance. A scientific investigator is someone who undertakes this type of activity. It is irrelevant if you call him or her a medical scientist, a dentist, a dental researcher or even a plain scientist. What does matter is that the research undertaken conforms highly to the above standards and that it be done by competent individuals. In light of this, it would perhaps be appropriate to suggest the rephras-

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ing of one of Dr. Larose's statements: "Valid investigations concerning the pathophysiologic effects of mercury should be determined by qualified scientists."

Finally, I have acknowledged in my article that persons with amalgam in their teeth are liable to exposure to mercury. This has not been "scientifically established" by the World Health Organization, but by various groups of researchers over a period of time. Some of these were even dental researchers. Their work has been collated in the reference cited by Dr. Larose. However, in reviewing this monograph, I failed to find any statement indicating that human exposure from amalgam fillings is "not insignificant when compared to dietary intake." What I did find was a table, based on data extrapolations, indicating that dental amalgams were the prime source of elemental mercury vapor, while food was the prime source for inorganic mercury compounds and methylmercury.¹ The same monograph further indicated that with respect to the safety of amalgam, epidemiologic studies as well as "reports describing different types of symptoms and signs" are inconclusive.²

The issue of the safety of amalgam requires an understanding of the biological effects of the low-level release of mercury in humans. Most recently, a panel of 14 scientists at the National Institutes of Health in the United States, after studying all the available data, concluded that the amount of mercury released from amalgam was insignificant and that its use was safe in humans.

The conclusion on amalgam in the biocompatibility section of my article purposely avoided the issue of safety. However, I did state that as a restorative material that has provided more worldwide, long-term service at low cost, and with low technique sensitivity, it is a standard. I stand by my conclusion.

References

1. *Environmental Health Criteria 118: Inorganic Mercury*. p. 24, World Health Organization, Geneva, 1991.
2. *Ibid.*, p. 21.



Dental Value Up to Individual

I write in response to the Letters/Courier section published in the June 1991 issue of the *CDA Journal*. I am so glad that Dr. Bill Nippond eloquently responded to Dr. Wolch's initial letter ("Dental Fees"), which appeared in the March 1991 issue.

I believe it comes down to one's values. Dr. Nippond valued prevention. In another

letter, Dr. Black valued prevention slightly less, while a patient of Dr. Yasny's had little value for prevention. The public can never fully understand the complexities of dental care. But when asked what they want from their teeth in their lifetime, they invariably respond, "Want them to look good, not hurt, keep them and want them to be white."

Now, if the above goals can be accomplished without a regular prevention plan, I would like to know how.

The value that one places on his or her dental health and appearance, I suppose, is up to that individual. My response to those who complain about the cost of dental services is, "if the cost of dental services is a concern, simply ask what the costs are before you ask for a procedure."

In our office, we try to examine and set out a plan before we commence. If the cost is a concern, we reach a workable solution before we begin. Since we started doing this, I have heard no real complaints. The only people who complain are those who leave their dental problems to the last minute and show up as emergencies in pain. When you really think about it, these are the least desirable patients.

Also, provincial dental associations should be far more assertive in dealing with these kinds of frivolous complaints. It is so easy to talk negatively about something. This is becoming a Canadian trait.

Kim W. Scott, DDS
Medicine Hat, Alberta



U. of T. Department of Pedodontics

Comments in the *Journal's* July 1991 News Update section regarding awards to Ontario Dental Association members ("Ontario Dental Association Honors Outstanding Members") require some clarification. The department of pedodontics at the University of Toronto was established in 1943. Dr. Sandy MacGregor was appointed head of the department and served in that capacity for many years. Dr. MacGregor was responsible for the founding and the development of the department.

R.E. Feasby, DDS, Dip.DPH
Toronto, Ontario

Abstract

Virus on Impressions

Practical and effective protocols for disinfecting impressions have yet to be derived. Little is known about how much viral contamination exists on dental impressions and how easily a known virucidal agent can do its job.

An animal herpes virus was exposed to six impression materials under conditions of simulated impression making. The virus was placed in the palatal area of metal models of the maxillary edentulous arch prior to full mouth impressions. The materials tested were: 1. polyether (Impregum, Premier); 2. polysulfide (Permlastic, Kerr); 3. vinyl polysiloxane (Reposil Type I, Caulk); 4. zinc oxide-eugenol (Surgident, Columbus); 5. alginates (Jeltrate Regular, Jeltrate Fast Set, Caulk). There were four test groups: a) impressions washed with five millilitres of culture medium after five minutes standing; b) as (a) after rinsing in tap water for five seconds; c) impressions from which thin layers were excised after five minutes standing; and d) as (c) after rinsing in tap water for five minutes. The virus was quantitated in all samples by a culture method.

The results showed that virus was recoverable from all materials with the exception of Reposil and Impregum, though some virus was found in a diluted medium from the latter. In group (b), after rinsing, reduced quantities of virus were recovered from the Surgident and the Jeltrates. No virus recovery was made from Reposil, Impregum or Permlastic. The results from groups (c) and (d) indicated that the virus was absorbed into the surface of the Jeltrate.

The authors conclude that **Jeltrate, Impregum, Permlastic and Surgident can harbor virus, but Reposil appears to be virucidal**. Rinsing in running water can reduce the quantity of adherent virus. The more impervious materials should be easier to disinfect but alginates may be more difficult. Δ

(Special thanks to *The Dentaletter*, July/August 1991. Subscription may be obtained at 416-869-1177)

Gerhardt, G.E., Sydiskis, R.J. *JADA* 122:51-54, 1991

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REFERENCES 1. Lamster J B et al CLIN PREV DENT 5:12-16, 1983 2. Gordon I M et al J CLIN PERIODONTOL 12:697-704, 1985 3. Di Paola L G et al J DENT RES 16:311-315, 1989 4. Overholser D et al J CLIN PERIODONTOL 17:575-579, 1990 5. Council on Dental Therapeutics Accepts Listerine J AMER DENT ASSOC 117:515-516, 1988



Dental Radiography

La radiographie dentaire

1. Atchison, K.A. and Luke, L.S. "Orthodontic radiographic usage by pediatric dentists." *ASDC J Dent Child* Jan-Feb. 1989; v.56(1), pp. 26-9.
2. Berkey, C.S. "Statistical methods for comparing dental diagnostic procedures." *Community Dent Oral Epidemiol.* Aug. 1990; v.18(4), pp. 169-76
3. Bristow, R.G. and others. "Thyroid dose distribution in dental radiography." *Oral Surg Oral Med Oral Pathol.* Oct 1989; v.68(4), pp. 482-7.
4. Heaven, T.J. and others. "Quantitative radiographic measurement of dentinal lesions." *J Dent Res.* Jan. 1990; v.69(1), pp. 51-4.
5. Hedin, M. "Developing solutions for dental X-ray processors." *Swed Dent J.* 1989; v.13(6), pp. 261-5.
6. Kaffe, I. "Objective and subjective analysis of the image quality of two E-speed dental X-ray films." *Dento-maxillofac Radiol.* May 1990; v.2(19), pp. 55-8.
7. Kantor, M.L. and others. "Efficacy of dental radiographic practices: options for image receptors, examination selection, and patient selection." *JADA.* Aug. 1989; v.119(2), pp. 259-68.
8. Kircos, L.T. and others. "Comparative evaluation of the sensitometric properties of screen-film systems and conventional dental receptors for intraoral radiography." *Oral Surg Oral Med Oral Pathol.* Dec. 1989; v.68(6), pp. 787-92.
9. Kogon, D.M. "New X-ray guidelines: Improved care at lower cost." *J Can Dental Assoc.* Jul. 1989; v.55(7), pp. 574.
10. Laskin, D.M. "Avoiding the overuse of radiographs. [editorial]" *J Oral Maxillo-fac Surg.* Mar. 1989; v.47(3), pp. 221-2.
11. Maddalozzo, D. and others. "Performance of seven rapid radiographic processing solutions." *Oral Surg Oral Med Oral Pathol.* Mar 1990; v.69(3), pp. 382-7.
12. McKinley, I.B. "Issue of safe dental radiography." *Endod Rep.* Fall-Winter 1989; pp. 19-20.
13. McKnight-Hanes, C. and others. "Radiographic recommendations for the primary dentition: comparison of general dentists and pediatric dentists." *Pediatr Dent.* Jul-Aug. 1990; v.12(4), pp. 212-6.
14. Miles, D.A. and others. "Information yield: a comparison of Kodak T-Mat G, Ortho L and RP X-Omat films." *Radio-maxillofac Radiol.* Feb. 1989; v.18(1), pp. 15-8.

15. Myers, D.R. and others. "Radiographic recommendations for the transitional dentition: comparison of general dentists and pediatric dentists." *Pediatr Dent.* Jul-Aug. 1990; v.12(4), pp. 217-21.
16. Pitts, N.B. and others. "An *in vivo* evaluation in children of the HPL bitewing device." *Journal of Dentistry.* Dec. 1989; v.17(6), pp. 272-8.
17. "Radiovisiography reduces dentist, patient exposure to harmful X-rays." *Dentistry.* Oct. 1990; v.10(3), pp. 17.
18. Razzano, M.R. and Bonner, P.J. "Radiovisiography: video imaging alters traditional approach to radiography." *Compendium.* Jun. 1990; v.11(6), pp. 398-400.
19. Reid, J.A. "X-ray guidelines must conform with provincial regulations." *J Can Dent Assoc.* Jul. 1989; v.55(7), pp.573.
20. Shearer, A.C. and others. "Radiovisiography for imaging root canals: an *in vitro* comparison with conventional radiography." *Quintessence Int.* Oct. 1990; v.21(10), pp. 789-94.
21. Stephens, R.G. and Kogon, S.L. "New U.S. guidelines for prescribing dental radiographs — a critical review." *J Can Dent Assoc.* Nov. 1990; v.56(11), pp. 1019-24.
22. Stirling, G.C. and Holloway, A.F. "Niobium filter v. an aluminum filter." *Ont Dent.* Jul-Aug. 1990; v.67(6), pp. 18-22.
23. Svenson, B and Peterson, A. "Accuracy of radiographic caries diagnosis using different X-ray generators." *Dentomaxillo-fac Radiol.* May 1989; v.18(2), pp. 68-71.

24. Wenzel, A. and others. "Depth of occlusal caries assessed clinically, by conventional film radiographs, and by digitized, processed radiographs." *Caries Res.* 1990; v.24(5), pp. 327-33.
25. Valentino, C. and Kenny, D.J. "HARP. Dental practice standards for Ontario radiation protection regulations." *Ont. Dent.* Jun. 1990; v.67(5), pp.15-6, 18-9.

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Book Reviews

LABORATORY TECHNIQUES FOR THE BRÄNEMARK SYSTEM

by Ross Taylor and Gary Bergman

1990, Quintessence Publishing Co., Inc., Chicago
79 pages, softcover, color and black & white illustrations, \$42 U.S.

The third printing of a manual first published in 1986, this book is directed at dental technicians who work with Nobelpharma's Bränemark implant system. Its authors claim that the manual describes how the hardware should be used to ensure the most biocompatible, functional, and esthetic restoration possible." To that end, the book reviews the concepts, instrumentation and components required for prosthodontic procedures.

Unfortunately, the manual is not entirely consistent. While the introduction to osseointegration is valuable for technicians who are unfamiliar with the Bränemark implant, the page explaining the components for abutment connection is poorly planned. The reader has to flip ahead to the actual pictures of the components, which are taken directly from Nobelpharma publications. As usual with the Bränemark system, an array of codes are used to classify various components, which generally serve to defy logic and confuse everyone involved, except perhaps the shipper.

Furthermore, the section outlining the components and instruments required for prosthodontic (restorative) procedures mentions only the Bränemark system options. Recent studies have shown that a number of other products are compatible.

The construction of surgical templates is important for implant procedures. Several methods intended to encourage better fixture placement are discussed in the manual. However, these methods have since been improved and simplified.

Furthermore, while the procedures for a mandibular fixed complete denture are well detailed, the duralay framework technique is largely obsolete thanks to the development of prefabricated, plastic-covered gold cylinders. No discussion of the situations where the cantilever section should be shortened due to fixture alignment and/or vertical leverage of the prosthesis is offered. And the section on casting the superstructure framework only lists two of many possible alloys.

On a more positive note, the verification and correction of fit of the framework is

a critical step and is described well on page 38. Conventional acrylic resin and light-cured composite resin processing is also outlined.

The section describing overdenture bar construction is good, although only the Nobelpharma overdenture kit is described. The Hader bar system is superior in many aspects. In addition, alternative retentive systems for overdenture are discussed. The authors claim the Nobelpharma NPH titanium base and plastic female with o-ring system is easy to use. My experience has shown the attachment to be too long to be adequately located within an area of resin bulk in the bases of maxillary overdentures. The surgeon should not select the abutment, but place reusable healing abutments first. Then the correct size of abutment may be selected following tissue healing. It is important to note that the shoulder of the ball abutment must be at least one millimetre above tissue, otherwise tissue impingement or incomplete sealing of the plastic female will occur, requiring a costly abutment height change.

Another incomplete section, "Construction of an implant supported fixed partial denture" mentions provisional fixed partial dentures but skips the description of their construction. The framework designs for fixed partial dentures are outdated. More esthetic and simplified maintenance procedures have already been described by several authors.

Construction of a single-tooth replacement is also described using an outdated technique. A good description of the technique used is provided, however, the resulting restoration is very bulky. This has been improved by the introduction of the Nobelpharma tapered abutment, which is an improvement over the UCLA abutment. The tapered abutment is marketed by Nobelpharma as the "Estheticone" abutment.

The uses of the Nobelpharma angulated abutment are described to correct fixture alignment problems. The abutment allows for correction of up to 30 degrees.

In conclusion, this manual is an update of the original Bränemark system laboratory manual. It is an excellent reference for common current methodology. However, it is obviously biased toward the use of Nobelpharma components and lacks the direction for the most esthetic results which can be currently achieved.

Reviewed by:
Brian K.S. Kucey, B.Sc., DDS, MSED,
FRCD(C)
Diplomate American Board of
Prosthodontics

THE BRÄNEMARK OSSEOINTEGRATED IMPLANT

Edited by T. Albrektsson, G.A. Zarb

1989, Quintessence Publishing Co. Chicago
262 pages, color illustrations

This textbook is an update of a previous publication, "Tissue Integrated Prosthesis: Osseointegration in Clinical Dentistry (Quintessence, 1985)." Two of the book's original editors have put together the updated reports of 29 internationally-renowned authors in the research and clinical branches of osseointegration. The table of contents identifies each contributing author clearly.

In part one, the first chapter contains a brief review of the biological perspective of Bränemark's titanium chamber research. Chapter 2 discusses titanium and the inflammatory response. Research methodology for clinical treatment evaluation and experimental studies is then explored, followed by a discussion of the possible causes of implant loss. The interaction between non-alloyed titanium implants and various tissues finishes the chapter.

Part two, the "Role of the Soft Tissue," reviews the findings and observations of a Toronto research group regarding the biological, microbiological and clinical aspects of the peri-implant mucosa. Extensive developments have improved the knowledge base in this important component of implant longevity.

Part three, "The Impact of Osseointegration on Oral Rehabilitation," reviews the current education process and teaching methodologies, as well as future trends in education, which incorporate a revolutionary change in attitudes and ultimately patient care.

The impact of osseointegration on pre-prosthetic surgery and the implant treatment of posterior edentulous areas is illustrated, as are the principles for single tooth replacement. Treatment planning and osseointegration are described in detail from both the periodontists' and the oral rehabilitation dentists' viewpoints. Functional and esthetic rehabilitation with Bränemark implants following oncologic surgery is included, as this area has expanded rapidly in the last few years.

In part four, past research regarding clinical outcomes using Bränemark implant systems, gathered from various centres worldwide, is reviewed. This section is capped by the clinical results of an impressive 24 team, multicentre study.

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Part five introduces the reader to developments in the utilization of Brånemark implants in ENT surgery and orthopedics. These rapidly evolving areas include maxillofacial prosthesis, joint replacement-hand surgical aspects, and the bone-anchored knee replacement.

This book is a valuable reference text which should be reviewed by all practitioners interested in the Brånemark implant technique and dental implants in general. The contents serve to highlight the significance of this technical advance on all aspects of dental practice. Due to its publication date in May 1989, some of the book's material is dated, particularly where it deals with single tooth replacement and the esthetic potential of oral rehabilitations. The non-dental areas of discussion are very interesting and the entire book is nonetheless the new benchmark, although new developments continue to occur.

Reviewed by:

Brian K.S. Kucey, B.Sc., DDS, MSED, FRCD(C)

Diplomate American Board of Prosthodontics

ORAL CANCER: EPIDEMIOLOGY, ETIOLOGY AND PATHOLOGY

Edited by C. Smith, J.J. Pindborg,
and W.H. Binnie

1990, Hemisphere Publishing Corporation,
New York
106 pages; black & white illustrations;
\$45 U.S.

This book was published in cooperation with UICC, the International Union Against Cancer. It is based on working papers originally prepared for a 1984 meeting on oral cancer, held in Copenhagen, which was meant to stimulate interest in various aspects of oral cancer in Western countries. The editors state that, because of delays in publication, the contributors were asked to incorporate significant recent advances into their chapters.

There are six chapters covering the topics of epidemiology, etiology, pathology, correlation between histopathology and behavior, TNM staging and suggestions for future research. The book will be of interest chiefly to oral pathologists, to research workers in oral cancer and to dentists and physicians engaged in the treatment of oral cancer.

The chapter on epidemiology, written by C.S. Muir and J. Stasjowski from the International Agency for Research on Cancer, Lyon, provides a good account of the remarkable differences in oral cancer incidence rates among different populations.

As always in such comparisons, the incidence of lip cancer in Newfoundland, which is the highest in the world, forming nine per cent of all cancers in that province and occurring chiefly in fishermen, is discussed at some length, but no new light is shed on the cause of this phenomenon. Similarly, the incidence rates of salivary gland cancer in the Northwest Territories and the Yukon, again the highest known, are highlighted. Deficiency in vitamin A is suggested as a causative factor.

Other chapters of note include one on etiology written by W.H. Binnie, which offers a comprehensive survey of all the known potential causes of cancer of the mouth. This material is presented in a balanced and judicial manner. In addition,

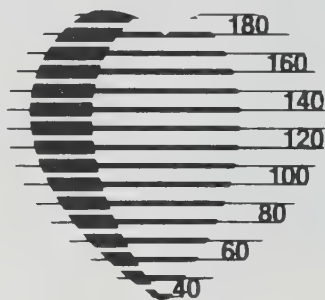
the chapter on pathology discusses, inter alia, the immunological methods of study that have now come into general use. The multifactorial grading system developed in Sweden to correlate behavior with histopathology is described. Whether or not this system will be of clinical value is still unclear, and the black and white illustrations used in this section are poor.

The list of references contains over 250 citations, and about 10 per cent of these are from after 1984. The book is well written and easy to read.

Reviewed by:

J.H.P. Main

Professor and head of the
department of oral pathology,
University of Toronto



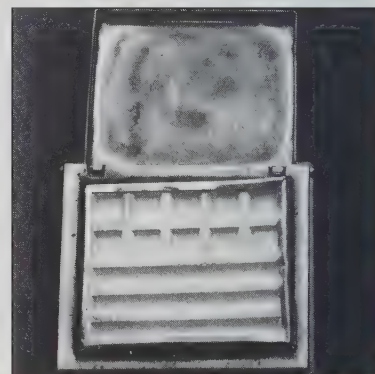
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JULY "WHAT'S IT?" SOLVED

The "What's It?" featured in the July issue of the *Journal* has been identified as a Pelton Crane gold foil annealer. Thanks to Dr. John Duggan, Stratford, Ontario; Dr. Benoit LaFontaine, Quebec, Quebec; Dr. Anne Dale, Toronto, Ontario; Dr. Allan Osborn, Winnipeg, Manitoba; and Dr. Marc Trepanier, Farnham, Quebec.

Photo verification has been found in a 1911 textbook, *Operative Dentistry*, edited by Dr. Edward C. Kirk of the University of Pennsylvania.





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Therefore, in 1958, the Royal College of Dental Surgeons of Ontario (RCDS) formed a committee to review the hodgepodge of existing plans and investigate the feasibility of combining them. It soon became obvious to the committee that the administration of dental insurance programs in Canada should be centralized.

The CDA board of governors were approached with the committee's findings, and asked to apply for a federal charter to create a new organization, one that would "operate a service agency capable of extending a complete consulting and accounting service to the dental profession and legally incorporated bodies . . . on a non-profit basis."

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Purpose: To protect you if a patient makes a claim against you arising out of your professional services. Current average coverage is \$2,000,000.

Personal Umbrella Liability Insurance

Purpose: To protect you against large personal lawsuits by offering extra insurance coverage for your home owners, tenants, or condominium liability, as well as liability for boats, recreational vehicles or vacation properties. Current average coverage is \$4,000,000.

Dentists' Staff Insurance Package

Purpose: This plan provides a package of basic life insurance, accidental death and dismemberment and long-term disability insurance. There are five different coverage levels related to your staff members' income. To be eligible, a staff member must be a full-time employee, under age 65, and work 20 hours a week for a dentist who is a member of the Canadian Dental Association or a co-sponsoring provincial association.

CDSPI provides a single point of contact for most of your insurance needs. We work with the insurers and other outside sources so that you don't have to. CDSPI handles administration functions, including initial application processing and premium collec-

tion, as well as several related service functions:

- National toll-free information lines for plan information and assistance.
- Development of printed information to keep you informed.
- A free insurance review service to help you make solid, informed decisions about your insurance coverage.

CDSPI also works closely with its consultants-brokers and major Canadian insurance companies to ensure that CDIP offers the highest-quality protection at the most competitive premiums available.

CDSPI's dedicated staff are trained to provide you with information about all their programs and services, and to help you make decisions that are in your best interest. A reliable, consistent source of information, in a variety of areas, is yours through CDSPI.

For further information about CDIP, please ask for the 1991 information kit, available by writing or calling, toll-free, to:

CDSPI
100 Consilium Place
Suite 710
Scarborough, Ontario
M1H 3G8

416-296-9401 Metro Toronto
1-800-561-9401 Service in English
1-800-665-9401 Service in French
416-296-8920 Fax

Remember, CDSPI is your service organization and we're working for you. Δ



CDA Retirement Savings Plan

Unit values: (Funds are valued weekly)

Fund	Unit values as at	
	August 31, 1991	July 31, 1991
Bond & Mortgage Fund	84.95952	83.84464
Common Stock Fund	17.35289	17.19791
Money Market Fund	57.33932	56.97417
Balanced Fund	33.18414	32.88454

G.I.C. Fund Term	*Interest rates as at	
	August 31, 1991	July 31, 1991
1 yr	8.85%	8.90%
2 yr	9.15%	9.25%
3 yr	9.35%	9.40%
4 yr	9.60%	9.60%
5 yr	10.10%	10.10%

(*rates subject to change without notice.)

Total Assets (Market value) of the Plan as of:

August 31, 1991	July 31, 1991
\$145,105,688.90	\$143,501,483.10

For further information:

Write:
CDSPI
Retirement Services Dept.
Suite 710
100 Consilium Place
Scarborough, Ontario
M1H 3G8

or phone, toll-free:
416-296-9401 Metro Canada
1-800-561-9401 Service in English
1-800-665-9401 Service in French
1-416-296-8920 Fax

Abstract

Root Canal Preparation

There are literally dozens of hand-operated endodontic instruments available for cleaning and shaping the root canal spaces. Claims are often made by the manufacturer that design and material related differences in an endodontic instrument make one type or another more efficient or more suitable for accomplishing this goal than another. Nine endodontic instruments from different manufacturers (Reamers, K-files, Hestrom files, K-Flex files, Flexofiles, S-files, Burns Unifiles, Flexicut files and Flex-R files) were evaluated as to their ability to reproduce a pre-established shape in a standard commercially available resin block with a simulated root canal having a 40-degree to 50-degree curvature.

In the apical part of the canal, the convex side of the curvature was enlarged in most instances to twice the ideal shape. The concave side showed little to no enlargement. In the middle third of the canal, the material removed at the convex side was less than the ideal and on the convex side, more than ideal. There were no significant differences among instruments. In the upper third of the canal, results on the concave side approached ideal, but there was a greater degree of material removed from the convex side.

None of the instruments tested was able to stay centred in the canal during instrumentation, however, "clinically acceptable results" were achieved with all of them. Digital and directional control was more readily obtained with the Flexicut and K-flex files than with the others. Δ

(Special thanks to *The Dentaletter*, July/August 1991. For subscription information phone 416-869-1177.)

Briseno, B.M. and Sonnabend, E. *Int Endod J* 24:15-23, 1991.

The DAP Advisor* offers information, ideas and advice to improve dentist-patient communication, raise awareness about good dental health, and help your practice become busier.

Some Tips on Effective Talking

- As much as possible, conduct lengthy discussions at eye level. Patients may find it disconcerting and intimidating to engage in conversation while they're lying down.
- Make eye contact frequently. This helps establish a connection between you and your patient and may also help put you both at ease.
- Say the patient's name occasionally during the course of the discussion. This also helps to break the ice and build rapport.
- Slow down. You're probably talking much faster than you think you are. Information is much easier to absorb when the person conveying it speaks slowly and clearly.

Five Reasons to Use The Five Point Prevention Plan in Your Practice

Since 1988, the CDA's Five Point Prevention Plan has been teaching Canadians about the importance of preventive dental care. Through posters, buttons, balloons, and two dental supplements, millions of Canadians have been introduced to its five easy to remember points — don't rush your brush; clean between; eat, drink and be wary; check your gums; don't wait until it hurts.

This recipe for good dental health has already proven to be an effective and powerful communications tool. Why not put it to work in your practice?

1. Open the lines of communication

Wear a T-shirt emblazoned with "LET'S TALK ABOUT THE FIVE POINT PREVENTION PLAN" or CDA's "Keep Smiling" T-shirt and display this message in big letters on your bulletin board, on your office door, and on your receptionist's desk. Such a display might pique patient curiosity — both those unaware of the plan and those familiar with it but unsure of specific details — and motivate them to ask for information. Of course, you don't have to wait to be asked. You can initiate discussion by saying "don't you want to know about the message on my shirt?"

2. Re-inforce the Good for Life message

Once the lines have been opened, you and the patient can go through the plan point by point, discussing your respective roles in preventive dental care, and stressing the team effort required to keep teeth good for life. This may afford the perfect opportunity to demonstrate proper brushing and flossing techniques, answer patients' questions and address any concerns.

3. Pave the way for future discussions

Showing the patient that you are knowledgeable and approachable and a source of information may encourage dialogue to continue in the future.

4. Build dental team-patient rapport

Taking time to discuss the plan demonstrates that you are a professional who takes time to care about the patient's dental health and to communicate the importance of maintaining it. This goes a long way to building dental team-patient rapport.

5. Foster the good will and encourage the return of first-time patients

First-time patients are potentially lifetime patients. Discussing the Five Point Plan during a patient's first preventive visit may give them incentive to return. To further show your interest, you might even make them up a Five Point Prevention Plan Package. The package — which can be wrapped in florists' cellophane and tied with a ribbon — can consist of the following items (which you may want to tag with the appropriate prevention point): toothbrush and three-minute timer ("don't rush your brush"); dental floss ("clean between"); small pocket mirror ("check your gums"); sugarless gum ("eat, drink and be wary"); a piece of string tied in a bow or a small calendar (don't wait until it hurts"). You might also want to include a copy of the plan, a "Keep Smiling" button, balloon, or bumper sticker — items that can be ordered from CDA.



The DAP Advisor is a service of CDA's Dental Awareness Program, an ongoing campaign dedicated to helping all Canadians keep their teeth Good For Life.

* Back by popular demand. This column was originally published in the October, 1989, Journal.



Intraoral or extraoral, the products and people you can count on come from Kodak. Why take a chance on anything less?

Ever since there were dental x-rays, the products you could count on for quality came in a yellow box. It's still that way today, and you know it'll be that way tomorrow as well. And if you do have a problem, your dealer in Kodak products is nearby, ready, willing and able to help. There's even a toll-free phone line direct to Kodak's own dental x-ray experts: call 1-800-465-6325, ext. 35147 (or, in Toronto, 766-8233, ext. 35147) Mr. Bob Hall. Kodak dental x-ray products. Anything less is taking a chance.

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The Canadian Dental Association is pleased to announce that CDAnet, dentistry's own electronic data interchange system, is now available



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- free your staff from claims-related administration under a manual system,
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(3) Obtain your CDAnet office number from CDA. And now you're ready to use CDAnet.

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CDAnet is owned and managed by dentists, for dentists, with most of the large insurance carriers belonging to CDAnet. And CDAnet is **Free** for all claims and predeterminations.

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CDAnet

Dentistry's National Information Network

**CDAnet toll-free number
from anywhere in Canada:
1-800-267-9701**

The Dental Laboratory and You

The New Posterior Alternative Esthetic Resin Posterior Restorations

The search for an alternative to traditional amalgam alloys — a material offering optimal esthetics as well as the ability to stand up in stress-bearing situations — has been under way since the development of the acid-etch technique over 30 years ago.

Today, the pressure on the dental industry to develop this "wonder material" has grown as patients increasingly demand cleaner, brighter and more perfect-looking teeth. This pressure has influenced dentistry's restorative choices — not only in the anterior region, but also in Class I and II restorations in premolars and molars. To date, no one restorative material has proven to be the optimal solution for all restorative situations, however.

Certainly, one of the key developments in the search for a new material was the introduction of the porcelain resin-bonded restoration technique. Featuring very conservative preparations, these laboratory-crafted restorations blend completely with the tooth, creating a very esthetic final result. And, the bonding process actually increases the overall strength of the tooth, surpassing even amalgam in that regard. In fact, in case situations such as inlays that bond the lingual and buccal walls, the porcelain resin-bonded restoration technique restored up to 95 per cent of the original tooth's strength.

At the same time, resin restorative materials for posterior teeth were introduced for use either in the operatory alone or in the operatory with assistance from a dental laboratory. These materials were particularly indicated in instances of parafunctional activity, such as clenching or bruxism.

Unfortunately, factors such as polymerization shrinkage tended to mitigate against satisfactory long-term results, particularly with those materials that were cured intra-orally. Today, however, with new fine-particle hybrid composite systems such as Brilliant (Coltene/Whaledent), Concept (Williams Gold) and Kulzer Inlay (Kulzer), it is possible for the laboratory to create beautiful posterior restorations that wear like amalgam, but also have the natural opacity and translucency that produce life-like esthetics.



Mr. H.J. (Hyo) Maier

The key difference with these systems over previous resin materials is the tempering process (either light-heat or heat-pressure cured, depending on the material) employed at the laboratory. All conventional chemical- or light-curing composites shrink during the polymerization process. This leads to marginal gaps over time.

When tempering is employed, the laboratory returns the restoration to the practitioner for bonding at its final dimensions. Polymerization shrinkage in the mouth is eliminated, leading to better contacts, contours and an unsurpassed marginal seal. The result: an accurately-fitting, highly-esthetic restoration with virtually undetectable long-term margins after cementing and finishing.

The tempering process also substantially increases the physical properties of these radiopaque, highly-filled materials above what was previously available with conventional composites. Tough and resilient, tempered restorations exhibit a markedly improved hardness that makes them ideal even in exceptionally high stress areas such as molars and in bicuspid situations that include a cusp or large restorations.

The material's optimal resin-filler composition ensures minimal water absorption and reliable color stability. And, its small particle size assures long-lasting esthetics and outstanding wear resistance through enhanced polishing success, and minimized plaque retention and discoloration.

Yet, tough as these restorations are, they are compatible with and minimize wear on opposing natural dentition. Furthermore,

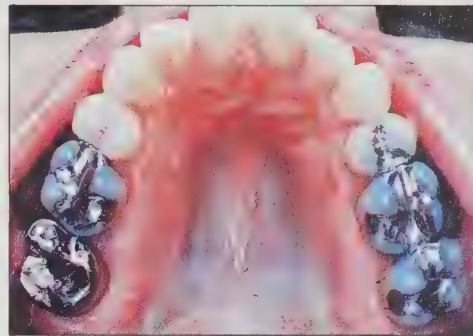


Fig. 1: Before



Fig. 2: After

they are fully biocompatible — tissue tolerance is excellent — and they can be readily adjusted or repaired at chairside. Δ

Mr. H.J. (Hyo) Maier, RDT is president of Aurum Ceramic/Classic Dental Laboratories Ltd.

Did you know?



Phone Responses People Dislike

When asked to identify the most annoying telephone responses, almost half of the 590 executives surveyed in a study selected "Please hold" — followed by an immediate click.

Other messages identified as being disliked include:

"Not in the office right now"

"Can you tell me what you're calling about"

"I'll connect you with voice mail"

(Thanks to Communispond Inc.,
385 Lexington Ave., New York, NY)

“CDA’s long-term disability benefits saved me. It’s that simple.”

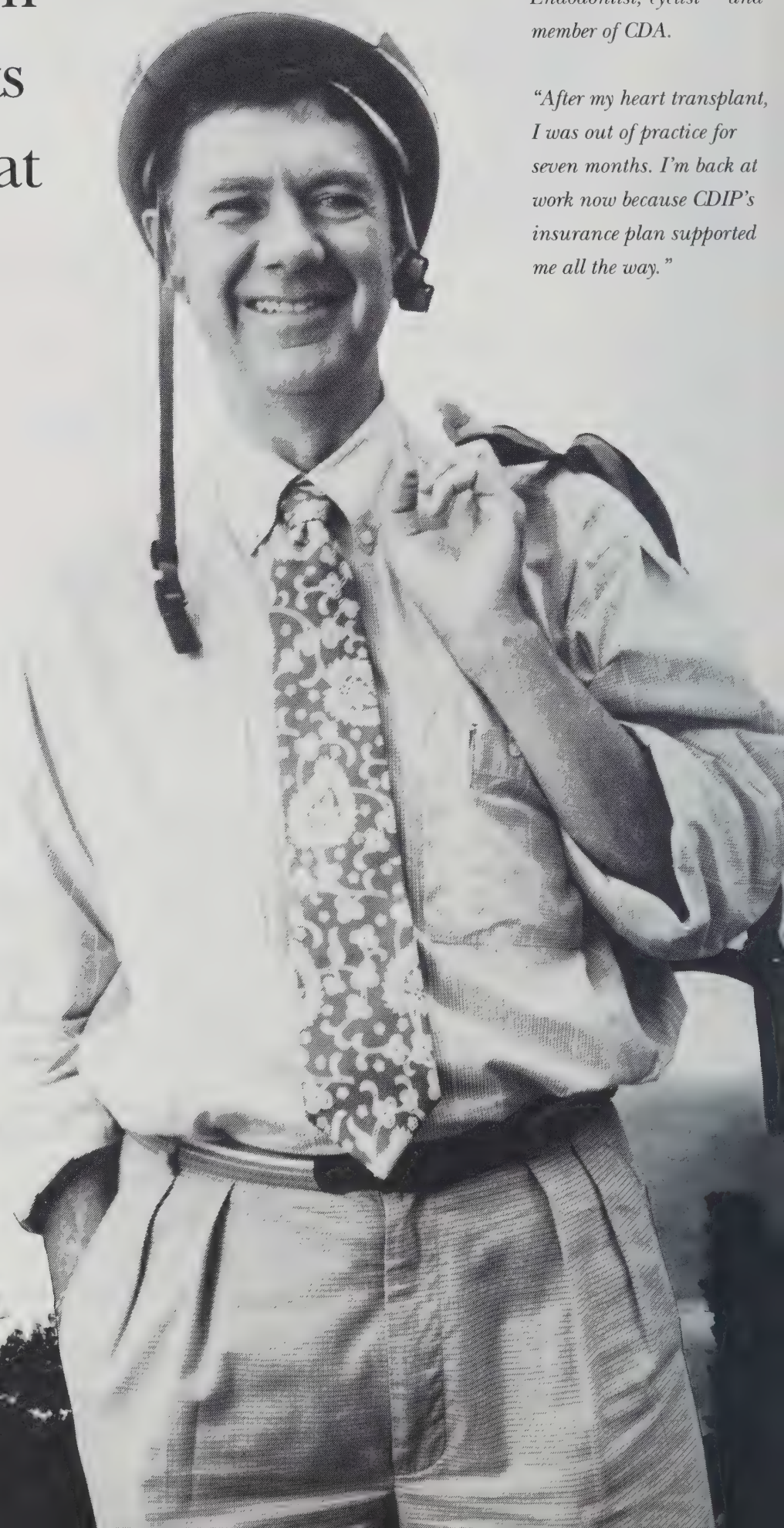
*Dr. Dennis Wells,
Ottawa, Ontario*

*Dr. Dennis Wells:
Endodontist, cyclist — and
member of CDA.*

*“After my heart transplant,
I was out of practice for
seven months. I’m back at
work now because CDIP’s
insurance plan supported
me all the way.”*



*Dividends — exclusive benefits like
insurance, CDAnet, and a host of
other free or discounted services. It’s
one of the ways CDA works for you,
and for dentists all across Canada.*



Mobilizing Your Workforce

If there is one factor that distinguishes a successful practice from an unsuccessful one it is the dental team. Successful practices have excited, motivated teams, but their unsuccessful counterparts can only dream of such a reality.

Your Vision

Putting together the kind of team you want — and keeping it — isn't a matter of luck. Successful dental practices have recognized what the corporate sector has known for years — that the human resource is the most important asset any business can possess.

To take advantage of that resource you must first define your practice philosophy. In other words, you have to decide what type of practice you want. Until you have pinpointed and fine tuned your own vision of your practice, you will be unable to attract people who can share that vision, and the enthusiasm you feel for it, as their own.

In selecting their staff, dentists need to look for more than pure technical skills. They want to attract warm, dedicated, dependable, empathetic, bright, self-motivated, mature, caring and considerate individuals. In today's market there are a number of applicants who can meet these requirements. The difficulty is providing a stimulating and challenging work environment that keeps these wonderful people around for a long time. Motivation is the key.

Motivation Tools

Staff motivation is a vast topic and cannot be fully covered here. I won't focus on the fashionable motives such as economic incentives and benefit packages. Rather, I have chosen to address the less common — though perhaps more effective — motivational tools.

Communication

To say that every aspect of your practice is linked to communication is no overstatement. The absence of effective communication is inevitably coupled with the absence of motivation. Without motivation, staff morale suffers and productivity plummets.

Regular staff meetings are an effective way to keep the lines of communication open. If you aren't already promoting the morning "huddle" you could be forfeiting



*Imtiaz Manji, B.Sc.
President of
ExperDent
Consultants Inc.*

one of your most effective communications vehicles. It is amazing how much can be accomplished in a 15-minute (or less) meeting before patients start flowing into your operatories.

Whether it's daily, weekly or monthly — I strongly recommend all three — well-planned staff meetings can work wonders. Meetings give staff an appreciation of what is needed — and what is expected — to reach the practice's goals.

Empowerment

Empowerment is the latest buzzword in the corridors and board rooms of the corporate sector. Managers are steering away from autocratic, hierarchical-style management in favor of the empowered work-team concept. Delegating responsibility to employees is effective. Studies have shown that employees will become "movers and shakers" if they are given the green light to do so.

And the dental practice is no exception. Delegating responsibility for decision-making is not only desirable, it's necessary. When there is a sense of team ownership within the practice it is natural that these "owners" will work harder. Staff need to have a voice in the formation of office policies and procedures if they are to be committed to the practice. They need to feel that they are not just killing time, but making an important and meaningful contribution.

Continuing Education

If you want to attract — and keep — the best and the brightest employees, you should encourage personal growth. Your staff must be able to look ahead and see opportunities for their personal and professional development in the practice.

Continuing education can be a powerful tool in recharging, renewing and revitalizing your team's sense of loyalty. Developing a sense of being committed to the

pursuit of knowledge is essential to keep the momentum going. Staff members need to know that your level of enthusiasm and support for their personal growth is unlimited and unwavering.

You may need to put a ceiling on the amount that you contribute to each staff member's education. But establishing a policy of sponsorship promotes goodwill between dentist and staff, and the overall efficiency and effectiveness that will surely result is well worth the time and expense.

You've Only Just Begun

Committing yourself to communicating with your team, empowering them and fostering their personal growth is only the beginning. Unfortunately, there is no master plan for ensuring success in the '90s, but choosing your practice philosophy, and the right team to support it, will definitely keep you on track. Avoid short-term infusions of excitement that can be grasped easily. They won't endure. The real skill is keeping the team motivated and enthused for as long as the practice endures.

How to Conduct a Successful Staff Meeting

The first rule for productive staff meetings is to put together an agenda. For staff members to feel involved in the meeting, each one should have a copy of the agenda.

Daily (15 minutes): The morning huddle is short. Reserve it for one thing and only one thing — the day's schedule. Review the charts of the day, discuss treatment plans, prepare for new patient visits, identify the danger zones in the schedule and pinpoint times when emergencies can be scheduled.

Daily meetings are best chaired by the scheduling secretary or the case management staff person, who should come to the huddle equipped with an organized format for the meeting.

Weekly (30 minutes): This provides an ideal opportunity to review the past week and set new objectives for the week ahead. Mistakes can be rectified and successes maximized. It is also a good time to discuss practice policies and procedures.

Monthly (2 hours): These longer meetings can be combined with a lunch break in the

practice. Review production, schedules, unproductive time and treatment acceptance for the past month. Discuss goals, plans and agenda for the coming month.

This is an ideal time to look at a wide range of issues, but you should only tackle three or four at once. Meetings fail when the team attempts to deal with every issue at a single meeting. Select the team members who are best able to solve problems and delegate them the responsibility to do so.

At the following monthly meeting, be sure that there are no items from the previous month's agenda outstanding.

Clearing Sessions (a full day): From time to time, it may be necessary to book a full-day meeting to deal with unfinished business. Even the most disciplined practices, with well-executed daily, weekly and monthly meetings, can find getting through the ever-growing "to do" list a battle. Often, despite the number of staff meetings, the same old items keep returning. Outstanding agenda items that remain unresolved over a long period are warning signals that a clearing session is in order.

TECHNOLOGY

Enjoyment Comes With Understanding

The resistance to automate a dental office lies in the fear of the unknown. There may still be some nonbelievers, but the reality is that if you are not already automated, it will only be a matter of time before you take the plunge. My recommendation is to prepare for the future now.

The support available to start up and get through the transition from a non-automated practice to an automated one is tremendous. More and more courses are offered to train staff in basic computer skills. Continuing education programs at virtually all colleges and universities are never lacking in computer courses. But you should know what you need.

I recommend that **everyone** on the team take the following courses:

1. Introduction to personal computers (PCs). This is essential for understanding how a computer works. Learning everything else is easier once you understand the hardware you're using.
2. Introduction to DOS or Introduction to the Macintosh. If you are using an IBM or IBM compatible, take an introduction to DOS (disk operating system) course. It will provide you and your staff with an understanding of the system from which virtually every software program operates.

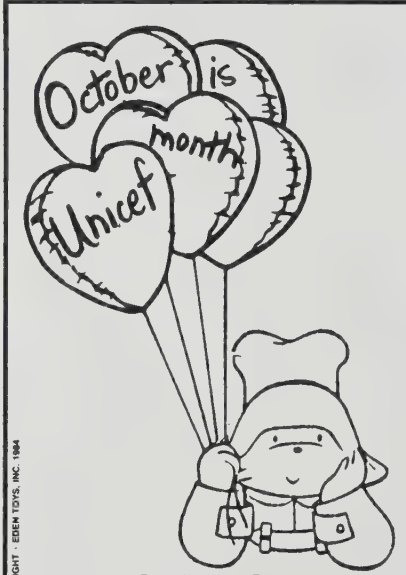
If you are planning to use the Macintosh, you will need a course that orientates you to the operating framework of the Mac.

3. Word processing. Studies indicate that word processing, in one form or another, accounts for 67 per cent of all computer operations.

And the forecast calls for more of the same.

Upon completion of suitable courses, the clinical staff can return to their operatories, comfortable with their new found knowledge. The administrative and office staff would be wise to continue with either a database or spreadsheet course. Database education is suitable for the front-end administrative staff such as the receptionist. Spreadsheet knowledge is essential for the staff involved in accounting.

After the staff is acquainted with computers and have familiarized themselves with their various uses, the barriers to bringing computer technology into your office — mainly fear — will no longer exist. Look forward to your dental team becoming energized and excited about the potential for automation to enhance their professional lives.



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Paddington Bear
UNICEF Halloween "Chairbear"

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TYLENOL*

acetaminophen

A LOGICAL FIRST CHOICE

ACTIONS:

Acetaminophen is an analgesic and antipyretic.

INDICATIONS:

TYLENOL* acetaminophen is indicated for the relief of pain and fever. Also as an analgesic/antipyretic in the symptomatic treatment of colds.

CONTRAINDICATION:

Hypersensitivity to acetaminophen.

ADVERSE EFFECTS:

In contrast to salicylates, gastrointestinal irritation rarely occurs with acetaminophen. If a rare hypersensitivity reaction occurs, discontinue the drug. Hypersensitivity is manifested by rash or urticaria. Regular use of acetaminophen has shown to produce a slight increase in prothrombin time in patients receiving oral anticoagulants, but the clinical significance of this effect is not clear.

PRECAUTIONS AND TREATMENT OF OVERDOSE:

Resuscitation and supportive care must proceed as for any other potentially serious overdose. In acute overdose, serum levels of acetaminophen are meaningful in predicting those patients likely to develop serious hepatic toxicity. They must be drawn between 4 and 24 hours post overdose and the values plotted on the Matthew-Rumack Nomogram. N-acetylcysteine (N.A.C.) is a highly effective antidote for acetaminophen poisoning. Do not delay administration of N.A.C. either by parental or oral routes if the ingested dose is likely to be toxic (> 150mg/kg ingested) or if serum levels are in the toxic range on the Nomogram. N.A.C. must be administered prior to the 24th hour post overdose to be protective. Further details on therapy of acetaminophen overdose are available by calling your regional Poison Control Centre.

DOSAGE:

Adults: 650 to 1000mg every 4 to 6 hours, not to exceed 4000 mg in 24 hours.

SUPPLIED:

TYLENOL* Caplets 325mg: Each white caplet, scored on one side and engraved "TYLENOL" other side, contains 325mg acetaminophen. Available in bottles of 24†, 50† and 100 caplets.

TYLENOL* Tablets 325mg: Each round, white tablet, scored on one side and engraved "TYLENOL" other side, contains 325mg acetaminophen. Available in bottles of 24†, 50†, 100 and 500 tablets.

TYLENOL* Caplets 500mg: Each white caplet engraved "TYLENOL" on one side and "500" other side, contains 500mg acetaminophen. Available in bottles of 24†, 50 and 100† caplets.

TYLENOL* Tablets 500mg: Each round, white tablet, engraved "TYLENOL" one side, and "500" other side contains 500mg acetaminophen. Available in bottles of 30†, 50 and 100 tablets.

TYLENOL* Gelcaps 500mg: Each solid capsule-shaped tablet, coated with red gelatin on one end and yellow on the other, printed "TYLENOL/500" on each gelatin coated end, contains: 500mg acetaminophen. Available in bottles of 24† and 50 gelcaps.

† Package is child-resistant.

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ATY-EJ-05/91

In case of personal disability...

will a lack of coverage add up to another problem?

No one plans on becoming sick or injured and unable to work — yet it can and does happen and *it can happen to you*. As you begin the recovery process, you really appreciate, *perhaps for the first time*, what a wise decision it was to obtain the protection of the Canadian Dentists' Insurance Program (CDIP) Long Term Disability and Office Overhead Expense Insurance.

Two separate plans, with two separate objectives, they work together to help you enjoy a financially worry-free recovery.

Personal and practice protection

CDIP's Long Term Disability Insurance provides a source of income that allows you to maintain your pre-disability standard of living and meet continuing *personal* expenses related to shelter, food, clothing, car expenses, and more. CDIP LTD allows you to insure up to 100% of your pre-disability, net after-tax income to the overall Plan

maximum of \$6,000 per month.

CDIP's Office Overhead Expense Insurance is designed to pay the continuing expenses of your office during a period of personal disability. These include important items such as rent, employee salaries, utilities, interest on loan and lease payments on office equipment, to the overall Plan maximum of \$15,000 per month.

Rates lower than many private plans

The premiums involved are much lower than private plans due to the pooled buying power of CDIP... a small percentage of your earnings invested in these plans will be well justified by the *peace of mind* such coverage brings.

Take time now to review your coverage in these plans. Don't wait until you have a health problem to increase or apply for Long Term Disability Insurance to maintain your pre-disability lifestyle... or until on-going expenses that could be

met by the protection of Office Overhead Expense Insurance put the future of your practice in jeopardy.

Long Term Disability and Office Overhead Expense Insurance are two of the most important plans offered through CDIP — a program sponsored by the Canadian Dental Association and the co-sponsoring provincial dental associations and administered by CDSPI... coverage tailored to the needs of the dental profession.

Ask for your free planning guide

We would be pleased to send you a free planning guide to help you determine the amount of coverage you need plus further detailed information on both plans. Call CDSPI toll-free today and ask to speak to a Personal Service Representative. After you have determined the coverage that is right for you, you can sit back and relax knowing you are protected against unforeseen problems.

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Fax

Computer Systems for Dental Practice Management A new generation of independent dental software

Dennis B. Gilboe, DDS, M.Sc., Cert. F. Pros.
David A. Scott, B.Sc., M.Sc., DDS

ABSTRACT

A new generation of computer programs for dental patient management eliminates total dependence on the vendor for programming support. The software design enables information collected with the dental system to be transferred to popular off-the-shelf programs designed for business. A simplified example is used to illustrate for practitioners the advantages of this type of data structure management. Programs designed on this basis offer optimum performance and expandability for both present and future needs.

SOMMAIRE

Grâce à une nouvelle génération de logiciels pour la gestion des patients dentaires, on peut désormais se passer entièrement du vendeur pour la programmation. Ces logiciels permettent de recueillir des données transférables à des logiciels populaires conçus pour le monde des affaires. À l'aide d'un exemple simplifié, on illustre les avantages que les praticiens peuvent avoir avec ces logiciels. Ils offrent un rendement optimal et, comme ils sont extensibles, ils peuvent s'adapter aux besoins d'aujourd'hui comme à ceux de demain.

Two decades ago, the computer systems designed for business and industry tended to be big, complicated, and incompatible. Furthermore, the cost of the early machines was such that only large organizations could afford to buy, program and operate them.

Back then, the computer industry functioned on a proprietary basis. The commercially-available software programs were controlled by the hardware manufacturers themselves, which generally meant that they were machine specific. A program developed by one manufacturer to run on its machines would not necessarily run on a competitor's machines, and so on.

Given this situation, computer users were forced to rely on the manufacturers for any improvements in the available hardware or software, or to write their own programs.

Fortunately, the microcomputer came of age in the 1980s. With its maturation, a new generation of user-friendly software programs was born. Developed by a growing number of independent suppliers, and designed to perform specific tasks, these programs could be purchased "off-the-shelf" at retail outlets. In addition, depending on the user's computer skills and the complexity of the software, the new programs were generally easy to learn and operate.

This trend continued into the '90s. Today, however, while most of the software packages available for microcomputers have highly specific applications, such as accounting or word processing, most of them also allow the user to transfer data from one program to another (a feature commonly referred to as integration). For example, information can now be entered into a computer through a database program, processed, and then transferred to a spread-sheet program. Later, the processed data can be output through a word-processing package to produce reports or correspondence.

Another positive development, brought about in large part because of the high level of competition that now exists within the computer industry, is the trend toward periodic software updates. Every few years, or so it seems, most suppliers release new and improved versions of their software, which generally expand the capabilities of their original programs, as well as exploiting advances in hardware technology.

Also, given the availability and cost of computer technology in the 1990s — for both hardware and software — it has become possible, if not essential, for small businesses to own their own machines. Training courses are offered at every user level and for every type of user — from secretaries to senior executives — at high schools and colleges across Canada.

Unfortunately, none of the available

courses, except for the ones on word processing, are of much use to the dental profession. Most of the custom software programs developed for dentistry to date are incompatible with the comprehensive, user-friendly and relatively inexpensive programs that are now common in the business world.

The Dependency Barrier

The dental software currently available in Canada tends to be vendor dependent, given that it is based on a custom-designed data structure. (Information is organized and stored by this software on a program-specific basis.) Consequently, these programs fail to meet the industry standards for microcomputer software, making it impossible for the user to "integrate" them with commercially-available, off-the-shelf software.

In effect, the capabilities of these dental programs are predetermined, and subsequent adaptations or improvements by individual practices are difficult if not impossible. The users are burdened and restricted by this dependency barrier. They must rely on the dental software developers to provide expanded program capabilities, which they could achieve relatively easily themselves if these programs could be integrated with off-the-shelf software.

The caution many dentists now feel about purchasing a dental computer system^{1,2} may well be attributable to the dependence concept. It is therefore essential for users desiring expanded capabilities and control to be provided with the ability to transfer information to integrated, off-the-shelf programs. This would allow the practitioner or office manager to adapt his or her dental software to meet individual practice requirements.

A standardized commercial database for information management — as opposed to program-specific databases — would enable data to be transferred to complementary software packages. This would provide the dentist with independence from the built-in restrictions inherent on the capabilities of even the most sophisticated custom-

programmed dental software. To date, no difference in software performance has been shown between professionally-programmed dental management systems using either a commercial or a custom-designed database.

Dental System Design

The three elements of a complete financial reporting system are: operational, financial, and decision support³ (Fig. 1). The most specialized of these is the operational element, as it is specific to a type of business or an individual company. Similarly, operational software invariably involves some type of database, and to achieve their optimum capabilities, operational programs require some custom programming.

If the database selected is compatible with the industry standards for micro-computer software, then the information processed with an operational program for dentistry will be compatible with and transferable to one of the commercially-available financial and decision support software programs, which are designed according to professional accounting and management principles.

Operational:

managing the critical operations in producing goods or services

Financial:

managing assets, liabilities, and net worth

Decision support:

integrating financial and operational information with external information such as market conditions to expedite management decisions.

Figure 1. Functions necessary for a complete financial reporting system.

Operational Software: Income Activities

The specialized task of operational software in dentistry is the management of patient information with visible audit trails in the following main categories: fee schedules, billings, payments, insurance, statements, accounts receivable, and appointments and recalls. If effective, efficient operational software is in place, a single entry typed into the computer to record the service provided and payment at the time of the appointment allows all these functions to be performed automatically. Thus, the program's objectives are to automate repetitive tasks for improved clerical

productivity and accuracy, and to reduce administrative costs. Office staff are then able to concentrate on the more productive and rewarding activities of patient communication and practice building.

However, given that few dental personnel have computer training, it is critical for the operational program to include user-friendly features. These should include standardized menus to select various tasks, color coding of data entry, and uncluttered, self-prompting screen displays for information entry. Ideally, software installation and training will be provided by knowledgeable, experienced staff, preferably with health-science backgrounds and demonstrated ability in teaching computer operations to dental auxiliaries with no computer experience.

Financial Software: Expense Activities

Accounts payable and accounts paid, including payroll and cheque writing modules, can be managed with the greatest accuracy and least cost by using one of the commercial programs already available to small businesses. These full-featured, flexible accounting programs allow the user to customize features such as deductible expense categories and individualized reports defined by the practitioner or requested by the accountant.

Decision Support Software

Decision support software is designed to integrate data from compatible operational and financial programs. Their use usually requires the professional expertise of a financial advisor such as an accountant, since most dentists are not familiar with the sophisticated financial tools routinely used in small business management. The features offered by these systems generally include cash-flow analysis, forecasting, cost analysis, lease-buy-depreciation analysis, tax analysis and control, and planning for financial independence.

Operational Software for Dentistry

The first generation of "off-the-shelf" dental-management programs used software concepts originally developed for other businesses. They were not developed as highly-specialized operational modules, but as conglomerates of the three financial reporting elements. As the expectations and experience of practitioners increased, however, second generation programs were developed specifically for dentistry.

A new generation of dental software features operational programs designed exclusively for the management of patient

information. These programs offer future expandability at a realistic cost, as they allow for integration with two financial systems, a feature not available with most custom programs. Indeed, the power and flexibility of the dental software currently available in these commercial packages has made custom programming comparatively uneconomical and unrealistic. Integrated commercial software packages with flexibility for dental practice adaptations provide cost-effective and unlimited performance features and adaptability.

The Database Core

Database languages are different from computer languages (such as BASIC or C). Almost all of the currently available dental management systems utilize a custom-designed database programmed in computer language. In contrast, a programmable relational database language is the foundation for the new generation of operational software systems being developed for dentistry. This software, because it is designed using a database language, provides compatibility with available financial and decision-support commercial software. In addition, SQL (Structured Query Language) will soon be the standard for customized information retrieval from within various database languages.

Two types of file are essential in a database: a *data file* stores information in specified compartments or fields, while an *index file* cross-references information contained in different data files having at least one common field. A *relational database* enables concurrent access to multiple data files as the "relations" link separate data files through common fields. The database language allows system and product-server developers to program complex systems.

The best-known, most widely-used program in the programmable relational group is dBase™, which has become the database standard for microcomputers.⁴ Since its introduction in 1981, four major software upgrades have been released. Furthermore, the program's developer encourages independent companies to produce specialized software that expands on the basic program's inherent capabilities. As a result, dBase IV is the most popular database program in the world — with over two million copies sold — and one of the three most successful software products in the history of microcomputers. It has complete relational capabilities, supports both single- and multi-user applications, and is designed for the implementation of SQL. Paradox™ and R:base™, are the next most popular programmable databases from among the more than 40 others available.^{5,6}

A Functional Example

Dental operational software is expected to perform a multitude of tasks. A simple example of how a relational database functions should suffice to demonstrate this point. In this example, information is entered into four basic *information data files*: patient, clinician, fee schedules, and insurance. The patient file contains demographic information (ie. name, address, telephone numbers), while the other files contain information pertaining to the billing clinician to whom all fees and payments will be defaulted, assignment to a fee schedule, and insurance background, including the name of the insurer, the coverage plan for various types of service, and the availability of co-insurance through a spousal plan. This information is entered into the computer during installation of the system, and for each new patient entering the practice.

When services are provided or payments received, this new information is recorded in *transaction data files*: patient ledger, guarantor ledger, insurer ledger, and a daily transaction ledger. The dynamic nature of transaction data files provides an electronic "one-write" system.

The information in both types of data file is linked or related by *index files*, a programming device for finding, retrieving, sorting, and storing entries in data files. These files perform mathematical computations on the information entered (services, fees, payments), and enable a single entry to be processed, then transferred automatically to numerous individual transaction data files. What data index files contain and how they are structured are crucial to the capabilities and speed of the entire system.

Phase 1.

On completion of the appointment, the patient's identification number is entered in the computer. Index files retrieve the first set of information from data files. The patient's demographics, assigned clinician and fee schedule, insurer, previous balance, and date of last payment are displayed on the terminal screen. The data and index file relationships are outlined in **Fig. 2**. Changes in the default values may be necessary, such as identifying that the service was provided by the hygienist, or selecting an alternative fee schedule due to the insurer responsible for the specific services performed (such as a provincial health plan) having changed.

Then, the CDA code for the service is entered. Information data files (**Fig. 3**) display the description of the code entered for verification. Upon entry of the tooth number and surfaces, the clinical and the

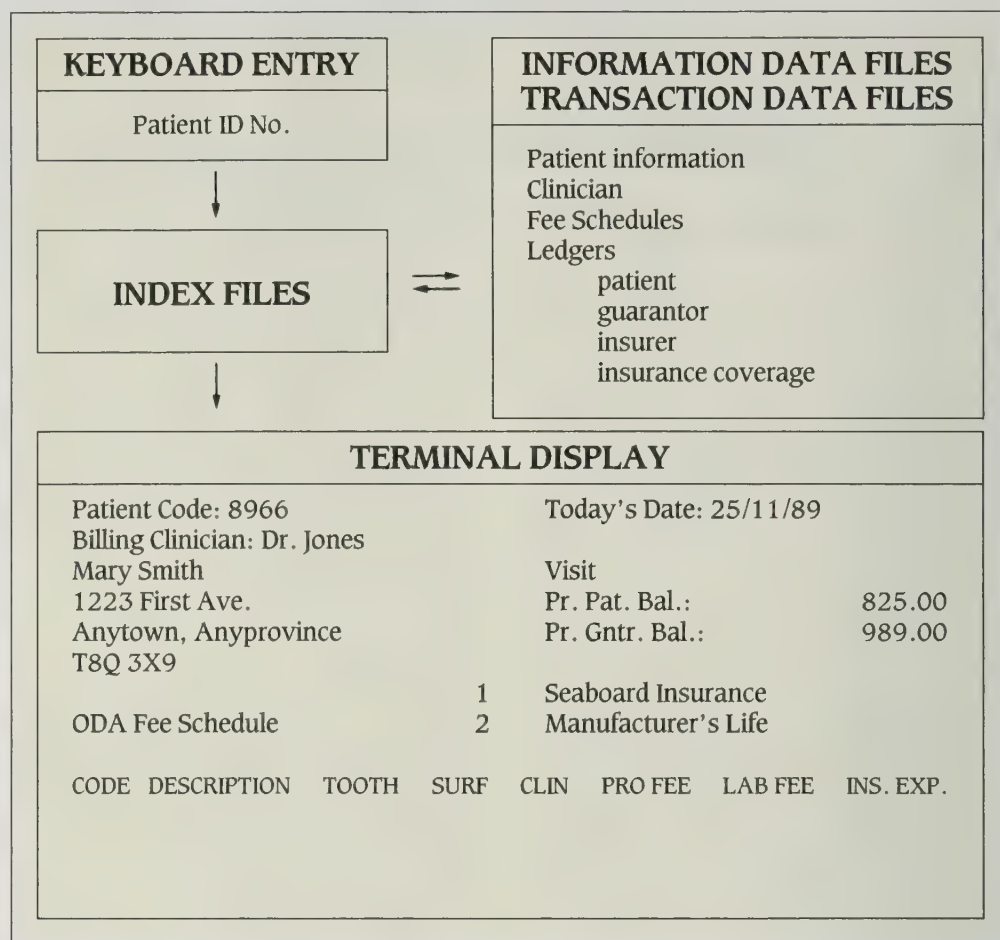


Figure 2. Information displayed from entry of patient identification number only.

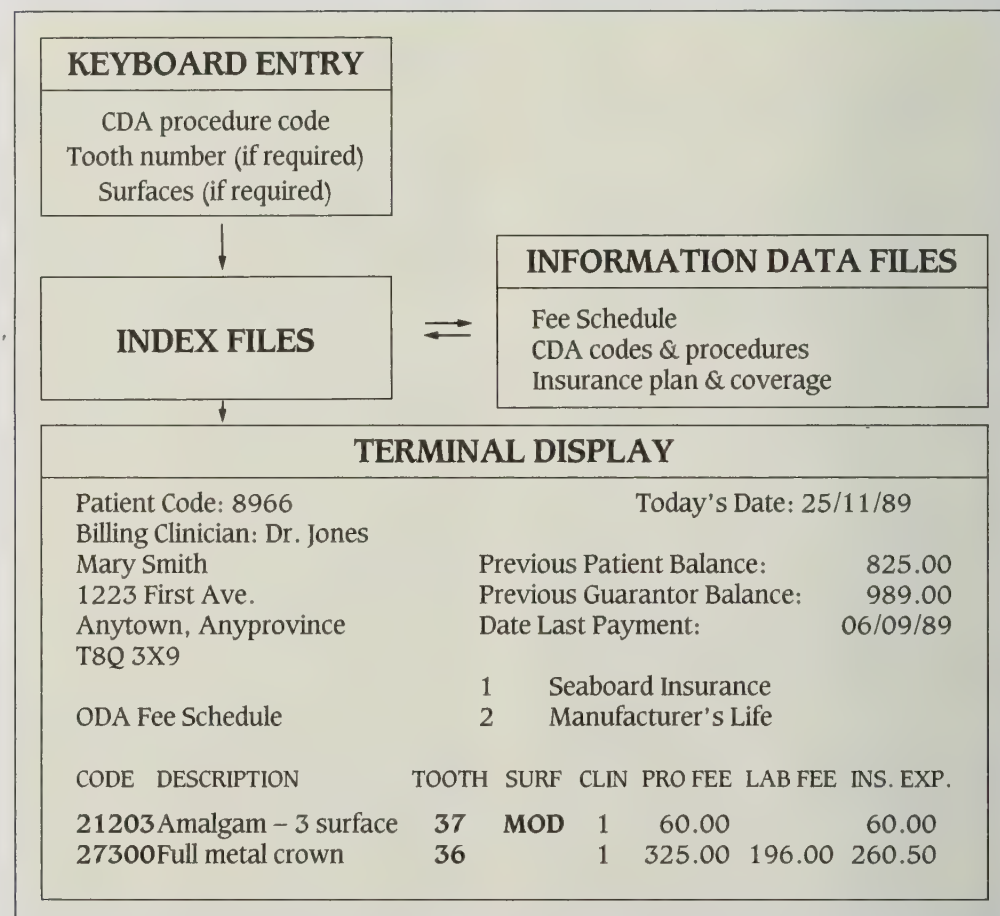


Figure 3. Display of fees assigned for patient and expected insurance payment. Bold items are keyboard entries, remaining information is automatically displayed following entry.

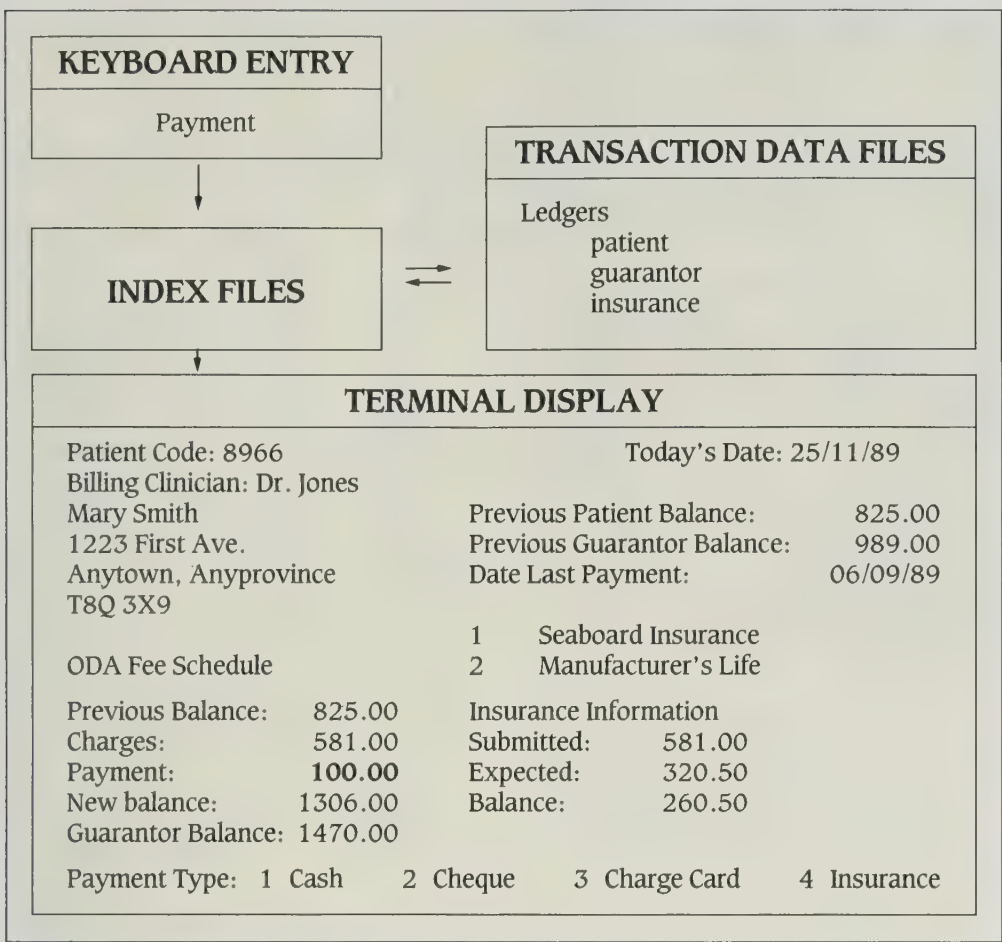


Figure 4. Fee postings and calculations from payment entered.

laboratory fee for the patient's assigned fee schedule is displayed, as is the expected insurance payment versus patient payment, as calculated from the applicable insurance plan — this activity is the domain of index files.

Phase 2.

Payment is entered, with computations including previous and new balances. Index files manage this updated data in temporary transaction information files (Fig. 4).

Phase 3.

Information is sent to the printer to produce an end of appointment statement and a completed insurance form. If the patient or guarantor has co-insurance, a supplementary form is automatically printed as well. Provincial health plans usually require a submission form, which differs from the standard Canadian Dental Association format. Once printouts have been produced, all entries and calculations are transferred to *semi-permanent* information and transaction data files (Fig. 5). These semi-permanent files must not be capable of modification or deletion without an accompanying *automatic journal entry* to

annotate the change. *This step is critical for financial control in establishing an audit trail.*

Phase 4.

At the end of the day, a daily summary (which is a trial audit printout) provides a listing of all patients seen, the procedures rendered, fees, and payments. If no corrections are required, all daily activities are transferred from temporary to permanent files, and a final daily audit report is printed that includes any corrected journal entries (Fig. 6).

This simplified example for one patient actually involved 10 information data files, 20 transaction data files, and 10 index files. A fully-functional operational program for dentistry requires 100 or more data files and in excess of 45 index files.

Software Design and Hardware Requirements

The speed with which information is either retrieved or stored by a dental operational program depends on both the software and the hardware. It can be argued that the software is more important, however.

For example, two different programs having exactly the same features can differ markedly in their execution speed. This is due to the programming architecture of the files and their relations. One criterion of how efficiently the program is written, also referred to as the "compact code," is the amount of main computer memory (RAM) required to run the program. For acceptable performance, the slower program usually requires a faster microprocessor and more RAM, which may be a comparatively unnecessary but significant expense. Less efficient coding in the program necessitates a greater storage capacity for the hard disk and concurrently degrades the speed of information retrieval.

Summary

Dental software can and has become compatible with the industry standards developed for existing commercial pro-

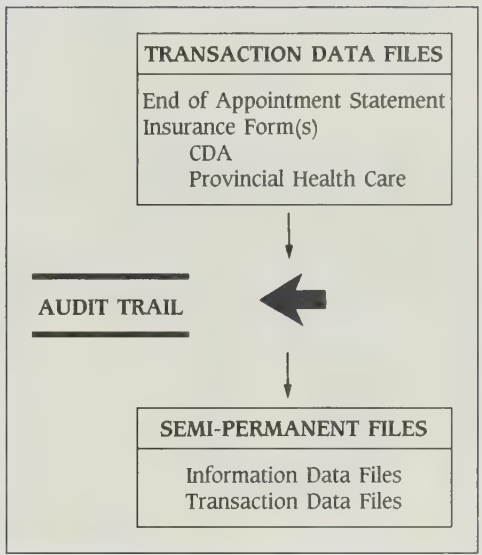


Figure 5. Printouts and audit trail.

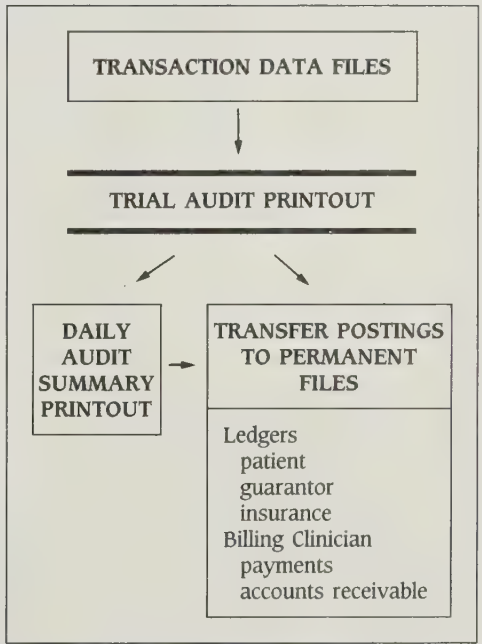


Figure 6. End of day functions.

grams by using a database language. The needs of the individual practice and the demands of insurers and dental associations, such as the new CDA procedure code designations, require a dynamic program structure. Significant modifications and enhancements of the program's capabilities can be accomplished with minimal time and expense. That adaptability ensures the operational program will not become obsolete. This new generation of dental software is designed for both *present and future needs of computerized information management*, allowing for long-term performance and expandability.

In this era of software specialization, dental program developers should focus on patient management systems, and ensure that dental information software management packages are compatible with off-the-shelf products. With the selection of an established database and complementary, inexpensive software, the analyses that currently can be done are unlimited. The major limitation is the dentist's knowledge of the financial and decision-support software currently used on microcomputers by professional managers. Thus the dental

system should be regarded as the portal of entry to the vast library of microcomputer software and financial management expertise that is currently available. Δ

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References

1. Stockton, H.J. Computers in dental practice: yesterday, today and tomorrow. *J Can Dent Assoc* 54:69, 1988.
2. Kogan, D.M. Dental management. System software. *J Can Dent Assoc* 54:93-99, 1988.
3. Dauphinas, G.W. and Lee, T.J. Making every number count. *PC Magazine*, Vol. 6 No. 5: 99-103, September 1987.
4. Seymour, J. Programmable databases: dBASE and its challengers. *PC Magazine* Vol. 7 No. 9: 93-122, May 1988.
5. Poor, A. Paradox in Programmable databases: dBASE and its challengers. *PC Magazine* Vol. 7 No. 9: 209-210, May 1988.
6. Puglia, V. R. base in Programmable databases: dBASE and its challengers. *PC Magazine* Vol. 7 No. 9: 252-254, May 1988.

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Orthodontic Treatment for the Adult Periodontal Patient

Harvey L. Levitt, DDS, FRCD(C)

ABSTRACT

The purpose of this article is to outline a method of orthodontic treatment for adult patients, particularly those with periodontal disease. The rationale for recommending orthodontics to these patients is discussed, with an emphasis on periodontal and occlusal management during treatment. Methods of using orthodontics to improve the periodontal status of adult patients are also demonstrated. Finally, there is a brief discussion on retention, and age considerations, as well as the obligations of both dentists and patients.

Introduction

Today, while many adults seek orthodontic treatment for cosmetic reasons alone, a large number of people do so on the advice of their general dentist. In these latter cases, orthodontics are generally recommended as an adjunct to treatment for the correction of periodontal problems, or as a means of providing a better foundation for restorative or prosthodontic procedures in patients with periodontally mutilated dentitions. A significant number of the "cosmetic" patients also have periodontally compromised teeth, or are susceptible to periodontal disease.¹⁻⁴

Periodontal and Occlusal Management

Before beginning orthodontic treatment, it is essential to bring the patient's gingival inflammation, if any, under control. Furthermore, it is essential to maintain this control throughout the course of treatment.⁵⁻⁷ Failure to do so will almost certainly result in periodontal attachment loss, and possibly in tooth loss, especially in the susceptible patient or in the severe clencher or bruxer (Fig. 1). A periodontist or the patient's general dentist should manage this aspect of the treatment, leaving the orthodontist with the responsibility for occlusal management and the prevention of occlusal trauma.⁴

Initial inflammatory control usually involves scaling and root planing to



Fig. 1a. Pretreatment.

remove all plaque and calculus, particularly where deep pockets exist. Open curettage or flap procedures may sometimes be required in areas where debridement cannot be accomplished through closed procedures. In addition, gingival grafts may be required when patients have thin tissues in areas of recession or inadequate keratinized tissue. The need for grafting will also depend upon the amount and direction of tooth movement.

Ongoing inflammatory control — through scaling and root planing at regular intervals — must be maintained throughout orthodontic treatment. In general, this should occur anywhere from once every three weeks to once every two to three months, depending upon the periodontal susceptibility and oral hygiene of the patient.

When adult periodontal patients are undergoing orthodontic treatment, it is especially important to control occlusal trauma, which can be accomplished in the following three ways:⁴

1. *Through selective grinding with a high-speed handpiece and diamond burs.* This may need to be done during each patient visit. However, an extensive adjustment of the occlusion — in terms of reshaping teeth, reducing steep cusps, and harmonizing cuspal inclines — should be performed prior to initiating tooth movement.
2. *By moving teeth in a particular sequence, and not attempting to correct all the teeth simultaneously.*⁵ If the mandibular anteriors are flared and spaced, they are usually retracted first. This is followed by the uprighting and aligning of the posterior teeth in both arches, while at the same time restor-

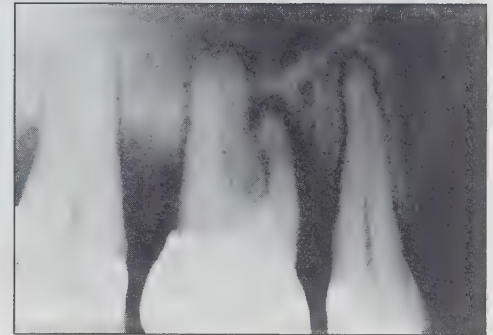


Fig. 1b Radiograph early in treatment with fixed appliances showing extraction of first premolar. Note calculus on roots, severely widened POL spaces, and early crestal bone loss on molar.

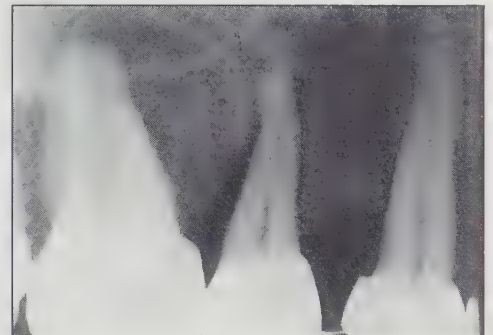


Fig. 1c Radiograph later in treatment showing uprighting of the canine. Note additional calculus on molar roots and considerable bone loss.

ing the lost occlusal vertical dimension and reestablishing posterior support. If the mandibular anterior teeth are crowded, however, it may be necessary to move the posterior teeth first in order to create space for the anteriors. Finally, the maxillary anteriors are repositioned.

3. *By disarticulating the teeth during movement.* This requires the use of a removable appliance with an anterior bite plane (modified Hawley bite plane appliance) during the correction of the posterior teeth, or of a posterior bite plane to disengage anterior teeth that are being moved out of cross-bite.

Obviously, given the desirability of controlling occlusal trauma, appliance design may be quite different for adult patients than it is for children.⁴ Often, treatment is begun with a removable appliance placed in the maxillary arch and fixed appliances



Fig. 1d Posttreatment. Loss of maxillary first molar as a result of poor inflammatory and occlusal control.

placed in the mandible or on the mandibular posterior teeth. Occasionally, fixed appliances may be placed on the maxillary posteriors while the patient is wearing a maxillary bite plane appliance. In most cases, though, full fixed appliances are eventually used to complete the tooth movement and to detail the teeth in the maxillary arch.

Periodontal and Restorative Considerations

Not all adult malocclusions require treatment.⁵ Therefore, unless there is a cosmetic concern, the general dentist should only recommend orthodontic therapy when there are valid reasons to do so. These can be divided into the following categories:

1. *The Malocclusion is pathologic.* Crowded, rotated, or badly-inclined teeth may limit proper oral hygiene, resulting in periodontal breakdown, especially in the susceptible patient. Furthermore, malposed teeth may impinge upon the tissues in the opposing arch, or may contribute to mucogingival problems or to Temporomandibular Joint (TMJ) dysfunction.
2. *Correction or amelioration of the osseous defects created by earlier periodontal destruction is desirable.* Since the alveolar bone is a component of the tooth, changes in the osseous configuration can be affected through orthodontic procedures.⁵ Tooth movement is often the best way to correct osseous defects. Furthermore, orthodontics, in combination with selective grinding, may help to create a better crown to root ratio, and an axial direction of force, enhancing the prog-

nosis for teeth with a compromised periodontium.

3. *Malposed teeth or jaws are preventing or limiting the execution of optimal or even adequate restorative procedures.* Occasionally, teeth may be so malposed that their preparation is extremely difficult or even impossible. Orthodontic treatment to place individual teeth into the correct positions in the arches is essential in these cases. In addition, when inter-arch relationships are changed in the course of restorative therapy – in the restoration of the occlusal vertical dimension, or in the elimination of centric relationship occlusion discrepancies, for example – changes in tooth position are required. In fact, orthodontics is usually the best way to restore vertical dimension loss in the bite collapse case. Orthodontics can also be used to compensate for minor skeletal dysplasias, eliminating the need for orthognathic surgery in many cases.

Additional Considerations

Although many other factors should also be considered when treating adult patients, retention, patient age, and the obligations of both dentists and patients are particularly important.

1. *Retention:* Where the periodontal attachment is severely compromised, it may be necessary to splint the patient's teeth following orthodontic treatment. This splinting may be of a permanent or of a temporary nature.^{10,17} Otherwise, as is the case with children, retention with a removable orthodontic retainer is

usually needed, and a period of supervision during this retentive phase is indicated.^{2,18}

2. *Age:* The chronological age of the patient is usually not a limiting factor. Orthodontics can be done successfully with almost any age group. However, the need for comprehensive orthodontic treatment, as well as the prognosis, will often depend upon the number of years that the existing dentition has survived in the face of periodontal destruction. For example, a 35-year-old patient with a malocclusion and some alveolar bone loss related to the malocclusion is more likely to require treatment than a 65-year-old with a similar condition.
3. *Dentist and Patient Commitment:* Where multi-disciplinary management is required in a treatment procedure, close coordination and cooperation between the various practitioners involved in the case is most important. Also, a total financial commitment on the part of the patient is absolutely essential.

Summary

A method of orthodontic treatment for the adult periodontal patient has been presented. The importance of recognizing periodontal susceptibility and of relating the malocclusion to the periodontal breakdown has been discussed. Several salient factors in the orthodontic treatment of adult patients have been touched upon, including the importance of inflammatory control and the control of occlusal trauma. It is hoped, as a result, that the reader will realize that the orthodontic treatment of the adult periodontal patient is quite different from the orthodontic correction of juvenile or adolescent malocclusions. Δ

Dr. Harvey Levitt is an associate professor of orthodontics at McGill University, and an assistant professor of orthodontics and periodontics with the University of Pennsylvania.

Editor's Note: Watch for further photo examples of Dr. Levitt's Case Reports in subsequent issues of the Journal.

References

1. Graber, T.M., Swain, B.F. Orthodontics: Current principles and Techniques. St. Louis, C.V. Mosby Co., 1985.
2. Levitt, H.L. Adult Orthodontics, *J Clin Orthod*, 5:130-155, 1971.
3. Zachrisson, B.U. Latrogenic tissue damage following orthodontic treatment: clinical and radiographic findings, in Cook, J.T. (ed.). Trans. of the Third International Orthodontic Congress, St. Louis, C.V. Mosby Company, pp. 488-501, 1975.
4. Levitt, H.L. Modification of appliance design for the adult mutilated dentition. *Int J Adult*

Orthodon Orthognath Surg, 1-1988, 9-21.

5. Amsterdam, M. Periodontal prosthesis — twenty five years in retrospect. *Alpha Omegan* 67(Dec): pp. 9-52, 1974.

6. Kessler, M.A. Interrelationships between orthodontics and periodontics. *Am J Orthod* 70:154-172, 1976.

7. Vanarsdall, R.L. Correction of periodontal problems through orthodontic treatment, in Hösl E., Zachrisson B.U., Baldauf A. (eds.), *Orthodontics and Periodontics*, Chicago, Quintessence Publ. Co., Inc., pp. 127-167, 1985.

8. Dorfman, H.S. Mucogingival changes resulting from mandibular incisor tooth movement. *Am J Orthod* 74:286-297, 1978.

9. Ingber, J.S. Forced eruption: Part 1. A method of treating isolated one and two wall infrabony osseous defects — rationale and case report. *J Periodontol*, 45:199-206, 1974.

10. Marks, M.H., and Corn, H. *Atlas of Adult Orthodontics*, Philadelphia, Lea and Febiger, 1989.

11. Marks, M.H., and Corn, H. The management of occlusal dysfunction in the adult by orthodontic means. *Compend Contin Educ Dent* 1(2): 81-91,

1980.

12. Bryant, R.A., McNeill, R.W., West, R.A. Orthodontics and orthognathic surgery: adjuncts to restorative and periodontal therapy. *JADA* 108:33-40, 1984.

13. Ceen, A.F., Rubler, C.G. Orthodontic intervention as an aid in restorative dentistry. *Dent Clin North Am*, 29:279-291, 1985.

14. Gazit, E., Lieberman, M. Occlusal and orthodontic considerations in the periodontically involved dentition. *Angle Orthod*, 50:346-349, 1980.

15. Geiger, A.M. Orthodontic assistance in the restoration of adult dentitions — the deep overbite. *NY State Dent J*, 55(3):89-98, 1985.

16. Marks, M.H., Corn, H. Adult tooth movement: alteration of the occlusal vertical dimension preparatory to tooth movement. *Alpha Omegan*, 70(3):54-61, 1977.

17. Rosenberg, S. A new method for stabilization of periodontally involved teeth. *J Periodontol*, 51: 469-473, 1980.

18. Levitt, H.L. High Labial retainer. *J Clin Orthod* 6(1):35-39, 1972.



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- *Patients have the right to receive prompt emergency care.*
- *Patients have the right to an avenue by which to express complaint.*

Canadian Dental Association - Board of Governors
(Motion passed August 1989)

Effects of glove powder on radiographic quality

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ABSTRACT

The use of powdered rubber gloves in the provision of dental care has produced a new variable in radiographic quality assurance procedures. Wearing powder-coated gloves while processing X-ray films can reduce the quality of the images obtained on processed radiographic film. To ensure that the optimum quality of processed film images is achieved, the operator must be careful to prevent the contamination of the film and processing solutions with powder.

SOMMAIRE

Lorsqu'on porte des gants en caoutchouc enduits de poudre pour donner des soins dentaires, on risque de compromettre la qualité des radiographies en manipulant les pellicules. Pour avoir des radiographies de qualité optimale, l'opérateur doit veiller à ce que la poudre de ses gants ne contamine pas les pellicules et les solutions de développement.

The American Dental Association (ADA) and the Centers for Disease Control (CDC) in Atlanta support the concept of "universal blood and body fluid precautions," including the routine use of protective gloves during the provision of dental care.¹ This paper reports on the diagnostic quality of radiographs and processing solutions when a thin film of corn starch or calcium carbonate is used to coat the disposable gloves worn by the operator.

Methods

Dental students exposing or processing X-ray films at the University of Pittsburgh's school of dental medicine are required to wear disposable gloves that have been pre-coated with a thin film of corn starch or calcium carbonate. The students all process their own X-ray films in an Allied AP-200 automatic film processor (Allied Photo Products, Norcross, Georgia) fitted with a daylight loader. Over

TABLE I

Densitometric readings of (stepwedge) radiographs

	Corn Starch	Calcium Carbonate
0.01 mg/mL	0.57	0.57
0.1 mg/mL	0.58	0.58
1.0 mg/mL	0.57	0.57
Pure Developer		0.58

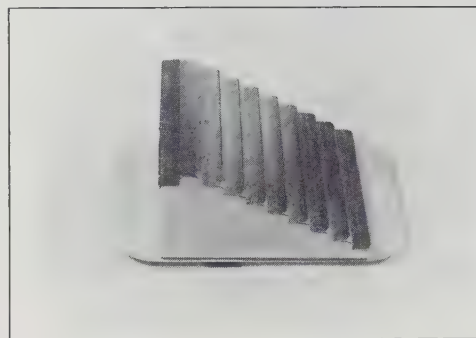


Fig. 1. Aluminum stepwedge.

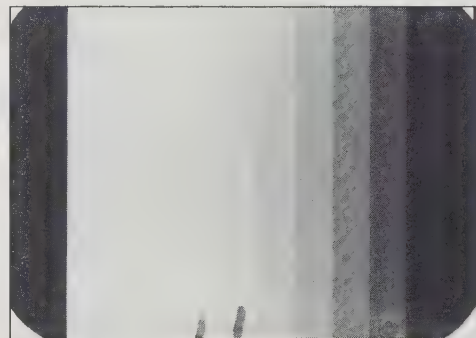


Fig. 2. Radiographs of aluminum stepwedge.

a period of one year, the effects of wearing powder-coated gloves on the quality of processed films, as well as on the frequency at which processing solutions had to be changed, were followed. The results obtained were then compared to records kept by the school prior to the implementation of the mandatory glove-wearing policy.

The asepsis protocol at the dental school now requires each student to wear a new

pair of "dry gloves" specifically for processing radiographs. Consequently, to determine if moisture on the gloves can exacerbate the problem of image quality, the principal investigator (PI) processed additional films that were handled with "wet gloves."

To study the effect of the corn starch and calcium carbonate glove coatings on the chemistry of the developing solution, concentrated solutions of corn starch (0.01, 0.1, and 1.0 milligrams per millilitre) and developer, and, similarly, calcium carbonate (0.01, 0.1 and 1.0 mg/mL) and developer were prepared. A spectrophotometric analysis of three samples of pure developing solution and three samples of each concentration of the corn starch and calcium carbonate contaminated developing solutions was conducted utilizing a UV-VIS microprocessor-controlled spectrophotometer system 2600 (Gilford Instrument Laboratories, Oberlin, Ohio). Each of the solutions was scanned using the visible light source (320-700 nanometres).

A densitometric analysis was performed on 14 Kodak Speed E group intraoral films that were exposed with an aluminum stepwedge for standardization (Figs. 1 and 2). Each film package contained two individual films. Pairs of radiographs were processed manually by the PI in samples of pure developer; 0.01, 0.1 and 1.0 mg/mL concentrated solutions of developer and corn starch; and 0.01, 0.1, and 1.0 mg/mL concentrated solutions of developer and calcium carbonate. The density of stepwedge image on all of the processed radiographs was then measured by the PI with a Densitron densitometer (Sargent-Welch Scientific Co., Skokie, Ill).

All processing solutions will deteriorate as the result of continued use and exposure to air.² To determine whether the contamination of the developing solution with powder had any effect on the life of the solution, a total of 28 five mL samples of pure developing solution and contaminated samples were prepared. The 28 samples consisted of four open tubes each of pure developer; 0.01, 0.1 and 1.0 mg/mL concentrations of calcium carbonate in developing solution; and 0.01, 0.1 and 1.0 mg/mL concentrations of corn starch

in developing solution. Fourteen of the samples were stored at room temperature (20 degrees Celsius), while another 14 tubes were stored at 37°C. The tubes were observed daily and the onset of color changes was recorded to determine if the addition of corn starch or calcium carbonate to pure developing solution would alter the onset of oxidation. Ordinarily, an unoxidized solution is pale yellow in color, while an oxidized solution is crimson-red.

Results

A spectrophotometric analysis of the contaminated developing solution demonstrated that the addition of corn starch to pure developing solution does not change the profile pattern of the solution (Fig. 3). Although contaminated solutions containing cornstarch gave absorbance readings higher than those obtained with pure developing solutions, the overall profiles remained essentially unchanged. Similarly, it was found that the addition of calcium carbonate to pure developing solution did not significantly alter the absorbance profile of the solution (Fig. 4).

Regardless of the concentration of the contaminated solution in which the standardized films were processed — 0.01, 0.1 or 1.0 — the densitometric readings obtained on the resulting radiographic images were essentially identical (Table I).

The time required for oxidation to occur in each of the 28 solution samples was assessed by observing changes in the color of the samples. Pure solution stored at room temperature did not begin to oxidize until it had been exposed to air for four days and only became crimson red on the fifth day. However, both the calcium carbonate and the corn starch contaminated solutions began to turn red on the second day and were crimson red by the third day.

There did not appear to be any differences in the oxidation rates between the calcium carbonate and the corn starch contaminated solutions, however, the solutions stored at 37°C turned crimson red approximately one day earlier than the solutions stored at room temperature.

In effect, then, developing solution that has been contaminated with either corn starch or calcium carbonate, or exposed to elevated temperatures, must be replaced more often than pure developing solution used at room temperature.

Glove moisture was also found to be a factor in radiographic image quality. Moisture on the gloves worn by the PI caused greater concentrations of glove powder to adhere to the radiograph, which resulted in the processed films having a smudged or speckled appearance (Fig. 5).

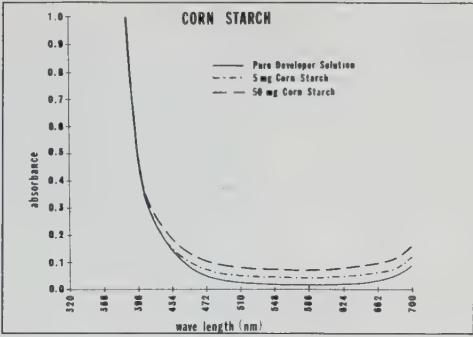


Fig. 3. Spectrophotometric analysis of developing solution contaminated with corn starch. Scans included are: pure uncontaminated developing solution, 5 mg corn starch (5 mg/500 mL or 0.01 mg/mL) and 50 mg corn starch (50 mg/500 mL or 1.0 mg/mL).

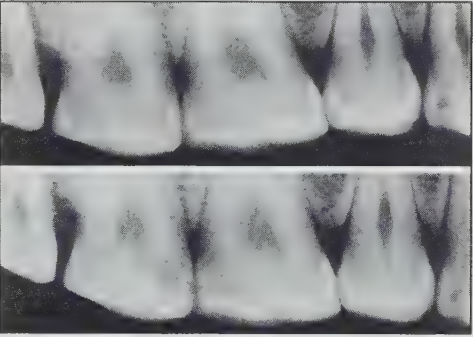


Fig. 5. A. Clean image
B. Note "speckled" area over second molar.

Daily examination of the daylight loader by the PI also revealed that a fine dusting of glove powder coated the entire area around the film insertion point, located near the rollers (Fig. 6). Upon removal of the processor cover, it was discovered that the rubber feeder rollers were noticeably coated with glove powder as well (Fig. 7).

Discussion

Prior to the institution of the mandatory glove policy at the University of Pittsburgh's school of dental medicine, film processing solutions were routinely replaced every three to four weeks. The time variance in the replacement of the solutions was dependent upon the patient flow through the dental radiology clinic, and, subsequently, student usage of the film processor. The primary criterion at that time for replacing solutions was a noticeable visual loss in quality (e.g. density) of the processed films. However, since it has become mandatory for students to wear gloves for film processing, a noticeable increase in the frequency at which solutions are changed has occurred. At present, the developing and fixing solutions are replaced every two weeks. The increased speed of oxidation of the developing solution as a result of glove powder

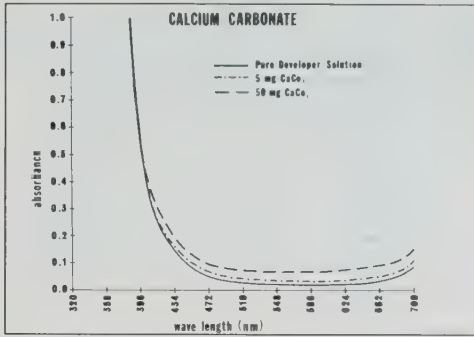


Fig. 4. Spectrophotometric analysis of developing solution contaminated with calcium carbonate. Scans included are: pure (uncontaminated developing solution), 5 mg calcium carbonate (5 mg/500 mL or 0.01 mg/mL), and 50 mg calcium carbonate (50 mg/500 mL or 1.0 mg/mL).

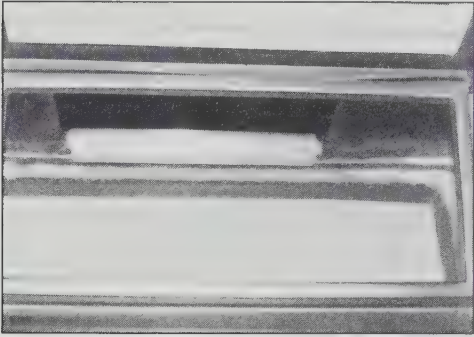


Fig. 6. Daylight loader contaminated with glove powder.

contamination corroborates the necessity for more frequent changes of the developing solution.

The primary reasons for replacing the solutions are either an appreciable loss in density of the processed films or the appearance of "smudged" or "speckled" films. This appearance results from the adhesion of powder from the students' gloves to the film emulsion, through direct contact between the gloves and the emulsion, prior to processing. However, this effect was only apparent when the films were inadvertently handled with moist gloves prior to processing. A dry glove coated with powder did not appear to result in a "speckled" film.

Oxidation was assessed by the change in the developing solution's color from a pale yellow to a crimson red. The results of this study indicate that the contamination of the developing solution with either calcium carbonate or corn starch significantly contributes to an increased rate of oxidation, which necessitates more frequent solution changes. Additionally, high temperature has been recognized as contributing to the deterioration of the strength of the developing solution.³ Similarly, in this study, temperature exacerbated the oxidation rate of the solutions. This was

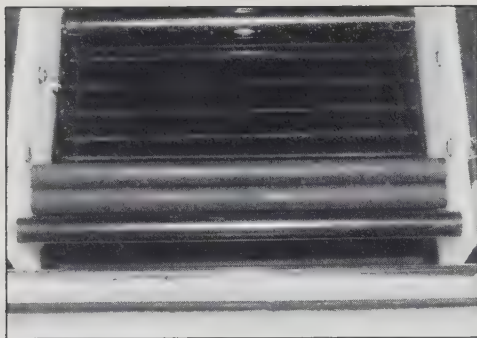


Fig. 7. Automatic processor rollers contaminated with glove powder.

evident in all of the heated solutions as compared with those solutions stored at room temperature, with the contaminated solutions being oxidized faster than the pure solutions.

The absorption curves obtained with spectrophotometric analysis reveal that a 1:10 solution of the contaminated developer is virtually identical to an undiluted pure solution. The corn starch and the calcium carbonate powders appear to concentrate the individual components of the developing solution, but the processing time required for each film was not affected.

Conclusions

This study indicates that corn starch and calcium carbonate contamination of developing solution has deleterious effects on the quality of the radiographs produced with this solution and on the longevity of the developing solution. The use of coated disposable gloves for processing films results unavoidably in: 1) a continual build-up of glove powder in and around the processor; 2) adhesion of glove powder directly onto the film emulsion during the removal of the film from the protective package and from contact of the film with the contaminated rollers; and 3) direct contamination of developing solution with glove powder. The net effect is that developing solution must be changed more frequently, resulting in additional costs.

This problem could most likely be corrected by using gloves that are not coated with powder. However, if powdered gloves are to be worn, a reduction of contamination could be achieved by: a thorough cleansing of the immediate areas surrounding the processor; wiping the processing rollers at the end of each day; avoiding direct finger contact with the film emulsion (i.e., handling the film only by its outer edge); and ensuring that the operator's gloves are dry when handling the pre-processed films. △

Acknowledgements

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Reprint requests to **Dr. Hubar**.

References

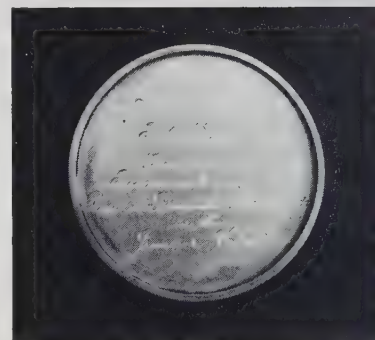
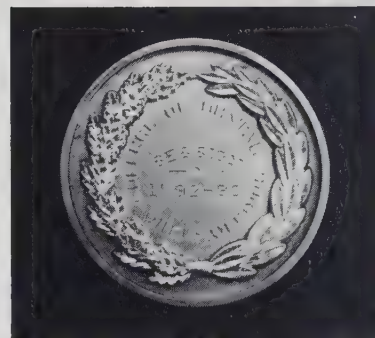
1. American Dental Association, Centers for Disease Control, and National Institute of Dental Research. Proceedings of a National Conference on Infection Control in Dentistry, 1986.
2. Goaz, P.W. and White, S.C. *Oral Radiology — Principles and Interpretation*. St. Louis, C.V. Mosby Company, p. 134. 1987.
3. Manson-Hing, L.R. *Fundamentals of Dental Radiography*. Ed. 3. Philadelphia, Lea & Febiger, p. 33. 1985.

“WHAT’S IT?”

Help the Museum Identify an Artifact from Yesteryear

Two silver medals were recently found in an Ottawa, Ontario, antique shop. Both medals were issued to **Edward G. Barnett** by the Ohio College of Dental Surgery. One is inscribed, “For the best examinations in prosthetic dentistry and metallurgy in the Junior Class (1892-93),” and the other, “For the best examinations in anatomy and oral surgery in the Senior Class (1893-94).”

Anyone with knowledge of Dr. Edward G. Barnett, or how the medals ended up in an Ottawa antique shop, is asked to contact Dr. Ralph Crawford, *Journal* Editor, 1815 Alta Vista Drive, Ottawa, Ontario, K1G 3Y6.



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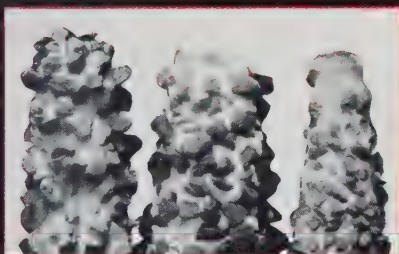
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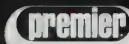
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A clinical study of radiographic selection criteria for edentulous patients

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D.H. Charles, DDS, MS
R.G. Stephens, DDS, M.Sc.
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ABSTRACT

This study was designed to determine if radiographic selection criteria could be developed and applied in the examination and treatment planning of edentulous patients. Fifty-one patients were examined and radiographs were prescribed for seven patients, where indicated by the selection criteria chosen. Previously-obtained screening panoramic films were interpreted first, for findings in the areas covered by the prescribed films, and then for occult findings in the remaining areas. Thirty-three patients showed occult positive findings, none of which had clinical significance. For this population, the prescription of radiographs provided the appropriate radiographic information for making treatment decisions. For the vast majority of patients (49), screening panoramic films were unproductive and therefore unnecessary.

SOMMAIRE

On a entrepris cette étude afin de déterminer si l'on pouvait fixer des critères de sélection pour les prises de radiographie et les appliquer lors des examens et de l'élaboration des plans de traitement pour les édentés. On a examiné 51 patients et, pour sept d'entre eux, on a prescrit des radiographies d'après des critères déterminés. On a d'abord interprété les radiographies panoramiques de dépistage qu'on avait obtenues au préalable afin de connaître les résultats dans les parties couvertes par les radiographies prescrites, puis les résultats occultes dans les autres parties. Chez 33 patients, on a trouvé des résultats occultes, mais aucun n'avait une importance clinique. Pour tout le groupe, les radiographies prescrites ont fourni les données radiographiques voulues pour élaborer les plans de traitement. Pour la majorité des patients (49), les radiographies panoramiques de dépistage n'ont rien révélé d'important et ont donc été inutiles.

The development and use of selection criteria are the most effective means of significantly reducing the unproductive exposure of patients to diagnostic radiation.¹ While technical advances in equipment, film speed, filtration and collimation have resulted in major reductions in radiation exposure, unless new imaging methods can be applied to dental use, further significant reductions in this area seem unlikely.

Selection, or high yield criteria are clinical and historical examination findings, which indicate when radiographs are needed for diagnosis and treatment planning. Although the use of selection criteria has been recommended for many years,² routine or screening radiography, by full-mouth periapical surveys or panoramic films plus bitewings, or both, remains the standard or preferred practice for examining dentate patients in 81 per cent of U.S. and Canadian dental schools, according to a report published in 1988.³ This study also showed that 79 per cent of the schools routinely prescribed panoramic films for the examination of edentulous patients.

In 1981, the U.S. National Center for Health Care Technology, in a forum on dental radiology,⁴ recommended that: "High-yield criteria need to be developed to serve as guides in prescribing radiographs on the basis of patient status rather than on temporal considerations." The forum then paradoxically concluded that an "initial radiographic study is desirable as part of the proper care of asymptomatic patients," which is screening or survey radiography.

In 1983, the Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration established an expert dental panel to develop patient selection criteria. The report of the panel was published in 1987.⁵ In its *Guidelines for Prescribing Dental Radiographs*, screening radiography was considered to be required for the examination of the edentulous patient. In 1988, the American Dental Association (ADA) published an updated version of its *Recommendations*

in *Radiographic Practices*⁶ in which it endorsed the conclusions of the CDRH. This very conservative application of selective radiography may reflect the limited research data available to the CDRH panel.⁵

In some respects, the lack of clinical studies on selection criteria is surprising, given that ADA,² for many years, has promoted the principle that radiographic examination should be "individualized for each patient," instead of the usual practice of "routine use of X-rays as part of the periodic examination of all patients."

The American Association of Dental Schools,⁷ in its curricular guidelines for oral radiology, has clearly stated that: "Selection criteria for ordering radiographs will be established by the school administration with assistance from the radiology department or division faculty."

In this study, we will critically assess the scientific literature supporting the practice of survey radiography for edentulous patients. As well, we will test clinically whether radiographs specific for each patient could be prescribed using selection criteria rather than a protocol of universal routine radiography.

Review of the Literature

There is an extensive body of literature on the use of routine or survey radiography for edentulous patients. The information observed in such surveys is usually reported as "positive findings," "pathological findings," "lesions" or "residual pathosis." Table 1 outlines the results obtained in some of the most frequently cited studies. Root tips, radiopacities, unerupted teeth, foreign bodies (almost exclusively amalgam scrap), radiolucencies and cysts, in the order named, are the most commonly reported "positive findings." Root tips were by far the most frequently observed positive finding. Benign tumors were extremely rare (0.09 per cent), and no malignancies were found.

In addition to these observations, two main categories of findings can be found

in the structures outside of the bone of the dental arches. These are calcifications (lymph nodes, stylohyoid process and ligament, and sialoliths) and maxillary sinus changes, principally mucous retention cysts and thickened mucosa. Not surprisingly, the authors have concluded that routine complete radiography for edentulous patients is essential in view of the very high incidence of occult positive findings. For example, Jones et al,¹⁵ having determined that 34.4 per cent of patients had positive findings, concluded that: "The per cent of positive findings in this study and those of previous studies support the fact that one of three edentulous patients has a potentially complicating condition within the denture base foundation." They directly related the percentage of findings to the "frequency with which the dentist is faced with the necessity of modifying the treatment plan."

To justify its support for the use of screening radiography, the CDRH's expert panel noted that "several studies show that 33 per cent to 41 per cent of the edentulous patients examined exhibited pathological conditions."⁵ In addition, the panel stated that radiographs may reveal anatomic considerations such as the location of the mandibular canal, the position of the mental foramen and the maxillary sinus, and the relative thickness of the soft tissue covering the edentulous ridge. The clinical relevance of these anatomic observations is supported by reference to the standard textbook literature.¹⁷

While the main body of the literature unequivocally supports pretreatment screening by radiography, some of the authors of recent studies question this practice. As part of a larger study, White et al¹⁸ evaluated the clinical effectiveness of using screening panoramic films for 117 edentulous patients. They reported that the procedure was unproductive for 96 per cent of these people. Two patients with retained roots had their treatment influenced by the radiographic information. These roots would have been missed had the screening been omitted. White et al concluded that panoramic films taken solely for screening have "only a slight probability of detecting significant conditions." Similarly, Lloyd and Gambert,¹⁹ in a longitudinal study of 86 elderly edentulous men, concluded that initial screening radiographs provided "little benefit" and that the annual follow-up revealed "no findings that required intervention."

In an analogous study of 33 elderly edentulous men over a 10-year period, Garcia et al²⁰ found that 39 per cent of the patients had "positive radiographic findings" on the initial panoramic study, but that only two patients (six per cent) had findings for which treatment "appeared to be indicated." Films were then repeated every three years in three follow-up examinations. The authors reported that "no changes occurred in the findings noted during the initial panoramic radiographic examinations and no new findings were observed in panoramic films taken over the

study period." In part, they concluded, "as in the case of other dental radiographic examinations, appropriate criteria should be defined for the utilization of panoramic radiography in edentulous persons in order to prevent excessive exposure administered as a matter of convenience in lieu of a careful clinical examination and history taking."

Lyman and Boucher²¹ reported observing 0.33 per cent clinically significant findings in screening pantomography of 300 edentulous arches. All of their patients had previously worn dentures, and by selection were free of any clinical findings that would have suggested the need for radiographs. The authors concluded that the "routine making of radiographs of patients wearing complete dentures should be discouraged."

Method

The study population consisted of 51 consecutive patients seeking complete denture treatment in the teaching clinic of the faculty of dentistry at the University of Western Ontario. There were 30 females, average age 61 years, and 21 males, average age 60 years. The age range for the population was 26-84 years. Of this sample, six patients had not previously worn dentures. For the rest, the average time of wearing a prosthesis was 19 years.

After obtaining consent, all patients were radiographed using a Siemens Orthopantomograph 10. The radiographs were not

TABLE I
Positive Findings from Radiographic Surveys of Edentulous Patients

	Ettinger ⁸ 1971	Scandrett et al. ⁹	Perrelet et al. ¹⁰	Ritchie et al. ¹¹	Tronje et al. ¹²	Alattar et al. ¹³	Spyropoulos et al. ¹⁴	Jones et al. ¹⁵	Keur et al. ¹⁶
# of patients	538	212	287	250	178	1,254	368	114	1,135
Root tips	173	115	44	144	41	104	114	14	521
Radiopacities	12	5	28	2	16	64	6	12	80
Unerupted teeth	21	1	17	25	16	29	34	1	51
Foreign bodies	4	10	7	1	1	7	3	10	17
Radiolucencies	4	3	5	2	5		20	2	
Cysts	10*		5	4	4	24**			15***
Calcifications***	4		4		21	130*	1		449*
Sinus					37	71**			30**
Other	3 Paget's		7 periapical lesions 1 cementoma 2 fracture	2 odontoma 2 sequestra 1 lipoma	1 bone defect				28 TMJ
Total findings	231	134	120	181	142	429	178	39	1,191

* includes 3 Stafne defects

** includes 4 Stafne defects

*** includes 3 Stafne defects

* primarily elongated styloid processes

** primarily retention cysts

*** lymph nodes, sialoliths and stylohyoid process

TABLE II

Selection Criteria*

- | | |
|-----------------|---|
| a. History of: | extraction complications; unerupted teeth or retained root fragments; chronic denture ulcers or pain on pressure, trauma |
| b. Signs of: | swelling — either soft, hard, general or local; localized infection; spicules or sharp ridge crest; root fragments; sequestra or foreign bodies |
| c. Symptoms of: | pain not related to technical problems with denture |

* Apart from specific criteria which relate to the denture base, selection criteria such as history of surgery to the jaws, gross asymmetries and a history of disease (eg. Paget's) which affect the jaws should be included.

viewed by the examiner (DHC) prior to or during the clinical examination. The standard protocol for intraoral examination was followed. In taking the history, special reference was given to questions on extractions and denture experience. The patients were asked if their extractions had been difficult, whether the dentist had advised them that root tips were left, if there were any postoperative complications and if they were aware of any unerupted teeth that were not removed. For any positive response, the patient was asked to locate the site.

For the purpose of prescribing radiographs, a selection criteria list was developed (Table II). Radiographs were prescribed according to these criteria, but only if the examiner, on the basis of clinical judgement, felt they were appropriate. The prescription was recorded but not filled. For these patients, the segments of the panoramic film which corresponded to the areas covered by the prescribed films were examined and the findings recorded. At this time, an assessment was made of the effect of these findings, if any, on clinical treatment.

The screening radiographs of all the patients were then interpreted for occult findings, excluding those sites covered by the prescribed films. The findings were assessed in terms of their clinical significance.

Results

The application of the selection criteria by the examiner resulted in the prescription of radiographs for seven (14 per cent) of the 51 patients. According to the protocol, those sites which would have been covered by the prescribed films were examined in the screening pantomographs.

Panoramic films were prescribed for two patients with a history of trauma. In the first patient, surgical plates and ligatures were seen in the area of a healed fracture.

The second trauma patient had presented with a bruise on the chin subsequent to a recent fall, but the film showed no evidence of fracture or other consequence.

The next two patients had reported localized postextraction sequelae. Three periapical films were taken of one of these patients, who had stated that chips of bone or tooth had extruded from three sites several years earlier. No evidence of pathology was found. The second patient had an irregular contour in one site following recent extractions. The film confirmed this and revealed some amalgam scrap in the area.

A fifth patient had two periapicals prescribed to investigate a recent history of pain in two edentulous sites. One of the films showed a slight condensation of bone in an extraction socket. For a sixth patient, an occlusal film was prescribed to assess a cleft palate that had persisted after surgery, while the last of the seven patients had a clinically visible root fragment. A periapical film was prescribed, which

revealed this root plus an additional adjacent root tip.

In all, two panoramic, one occlusal, and seven periapical radiographs were prescribed. The information yield from these films only had an active impact on the treatment of the patient with the two retained roots.

The panoramic screening films for the remaining 44 patients, and for those sites in the panoramic films not covered by the prescribed films taken for the seven patients noted above, were examined by the authors to determine if occult findings were present. These were defined as observations for which there were no clinical signs, symptoms or history that would indicate their presence. In 33 patients, or 65 per cent of our population, occult findings were seen (Table III). The authors assessed these findings, which would have been undiscovered if just the prescribed films were used, in terms of their effect on the planned denture therapy. None of the 58 positive findings had an effect on the treatment plan.

Discussion

The prevailing philosophy of screening radiography for the edentulous patient is stated in one of the most respected prosthodontic textbooks,¹⁷ which says that: "Radiographs are essential for evaluating conditions existing in every patient needing prosthodontic service." The authors suggested that abnormalities are "often unsuspected because of the absence of clinical signs or symptoms. . . and have been demonstrated in a high percentage of patients on radiographic examination." Therefore, they concluded that: "A panoramic film should be taken routinely."

TABLE III

Occult Radiographic Findings

Type	No. of Patients	No. of Findings	% of Total Findings
Bone condensation	8	8	13.8
Root fragment	4	4	6.9
Foreign body (amalgam)	4	4	6.9
Radiolucency (healing socket)	1	1	1.7
Pneumatized sinus	12	18	31.0
Mucous retention cyst	1	1	1.7
Mucositis	1	1	1.7
Elongated styloid	9	16	27.6
Lymph node calcification	2	2	3.4
Bony protuberance	1	1	1.7
Surgical plate or ligature	1	2	3.4
Totals	44*	58	100.0

* Patients often had more than one type of positive radiographic finding so that total patients exceed number (33) with occult findings.

This doctrine is based upon the conclusions drawn from most of the studies in the periodical literature.

There is no question that high information yields have been reported for screening radiography, and if the results are taken at face value, then the practice appears justified. If, however, the findings are examined in terms of their impact on patient management, the utility of such observations will be much less apparent. For example, while Ettinger⁸ reported 173 residual roots (75 per cent of total findings), only 10 had clinical significance and most of these were evident on inspection. In other words, 94 per cent of this major information category was not a factor in treatment. This conclusion applies to the majority of the studies reported (Table I). Herd²² found that of 228 roots removed and examined histologically after disclosure by radiographs, 73 per cent showed no clinical or radiographic abnormality. Such conclusions are reflected in the current approach to treatment, which holds that buried, retained roots without clinical or radiographic signs or symptoms do not require surgical removal. This same doctrine applies to the disclosure of unerupted teeth. In fact, the deliberate retention of roots is a clinically accepted technique to preserve alveolar bone.²³

Radiopacities are another commonly reported finding within the denture base. Discrete condensations of bone, particularly in the mandible, are observed in many patients and are usually considered to be variants of normal. Some are non-inflammatory sclerosis that is residual to pulp infections after the removal of teeth. Although there are pathological lesions which show calcifications radiographically, these are extremely rare and have either distinctive radiographic characteristics or are accompanied by signs or symptoms. There was no indication in the studies reviewed that the radiopacities were inflammatory, degenerative or neoplastic. The disclosure of harmless variants of normal, which do not affect treatment, serves no purpose except to distort the aggregate findings used to justify screening radiography.

Some studies^{13,16} have included substantial numbers (30-40 per cent of total findings) of calcifications of structures peripheral to the denture-bearing areas, mainly calcified lymph nodes, elongated styloid processes and calcified stylohyoid ligaments. When intraoral radiographs were standard practice, these calcifications were not seen and played no role in diagnosis and treatment planning. With the advent of pantomography, however, they are now reported as part of the positive

TABLE IV

A Comparison of Root Tip Findings in Recent U.S. and Foreign Studies

I U.S. Studies	No. of Patients	No. of Roots
Alattar et al (1980)	1,254	104
Lloyd and Gambert (1984)	86	6
Jones et al (1985)	114	14
Catelli et al (1987)	289	16
Garcia et al (1987)	33	33
Lyman and Boucher (1990)	150	0
Total	1,926	143
Roots per patient		.07
II Foreign Studies		
Ritchie and Fletcher (U.K. 1979)	250	144
Tronje et al (Sweden 1980)	178	41
Spyropoulos et al (Greece 1981)	368	114
Keur et al (Australia 1987)	1,135	521
Total	1,931	820
Roots per patient		.42

findings used to justify screening radiography, even though they continue to have no significance in prosthetic treatment and have negligible consequences for the patient's general health.

The reported findings that could legitimately be described as pathological lesions constitute a small fraction of the total findings. Even this is exaggerated, for example, by the inclusion of anatomical variants such as Stafne defects in the reporting of cysts. Similarly, the majority of sinus findings are mucous retention cysts, which usually have no clinical significance, while the foreign bodies are overwhelmingly harmless amalgam scrap. When these findings of little or no clinical significance are removed from the totals, the percentage of pathological findings that affect treatment is exceedingly small.

In a perceptive comment on the supporting literature for screening pantomography, Lyman and Boucher²¹ suggested that "the application of these findings (studies of non-U.S. populations) to a general North American population is questionable." As seen in Table IV, when several U.S. studies were compared with foreign studies having a comparable total patient sample, six times the number of roots were found in the foreign populations. Since retained roots compose the bulk of so-called pathological findings, and indeed are responsible for most of the small number of "radiolucencies" reported, the use of these studies is certainly questionable.

In making its recommendation in support of survey radiography in new edentulous patients, the CDRH⁵ special panel used three foreign references^{10,14,16} and one

U.S.¹⁵ reference to support the belief that a high information yield results from screening radiography.

In assessing the role of panoramic radiography in the general screening of dental patients, Barrett et al²⁴ suggested that there was very little critical evaluation in the literature. They noted that most studies did not balance the number of findings against their clinical importance, nor did they distinguish between unexpected or occult findings and those that would have been predicted from clinical examination. In recent U.S. studies, where the authors¹⁸⁻²¹ have assessed their results on such principles, they concluded that screening or baseline radiography for the edentulous patient has limited value. In fact, two of the studies^{19,21} concluded that recall radiography had no value whatever.

In this study, if we treated our results in the conventional manner, positive radiographic findings would be reported for 65 per cent of our patients. These would conform to the typical range of items found in previous studies (Table I). The number of root tips would be significantly less than the number usually reported in foreign studies, but similar to recent U.S. studies.

On the basis of such a high prevalence of "positive findings," we could have concluded, as so many others have done, that screening radiography is an essential prerequisite for prosthetic patient management. If, on the other hand, our occult findings (Table III), stripped of all idle observations, were analyzed in terms of those findings that would affect treatment plans, then the assessment of the value of screening would be more realistic. Occult

findings did not modify the treatment for any of the patients we examined for whom radiographs were not prescribed.

For one of the seven patients, who by our selection criteria had radiographs prescribed, there were two observations (roots) which affected treatment. However, radiographs did not reveal any pathologic changes in either of the two patients with histories of trauma. From this we could suggest that a history of trauma alone, without meaningful signs or symptoms, may not be a useful selection criterion. A similar judgment may be appropriate for the patient with a past history of bone chips following extraction, and also for the patient with a ridge irregularity. On the other hand, radiography is an appropriate diagnostic aid for the patient with pain, unless the pain is caused by a condition that the radiograph could not possibly detect — an apthous ulcer, for example. Again, for our patient with the cleft palate only partially closed by surgery, examination by radiography seems prudent.

If only the prescribed films, i.e. two panoramic and eight intraorals, had been taken for our study group of 51 patients, then a considerable savings in both cost and unnecessary radiation exposure would have been realized. The 49 screening panoramic films, although producing a substantial number of occult findings, could have been eliminated without prejudice to the prosthetic treatment.

Conclusions

Until recently, studies on the value of routine radiographic examination of edentulous patients simply catalogued all observations. The predictably high percentage of findings was then used to justify the practice. A few recent studies have critically analyzed such results in terms of clinical relevance, and have concluded they are largely inconsequential. Our study supports this view.

The selection criteria formulated and employed in this study resulted in the prescription of radiographs for seven of the 51 patients examined. For the patients with pain, a patent cleft palate and the patient with a protruding root, the prescribed films were unquestionably indicated. For the patients with clinically healthy mouths, but with a history of trauma, difficult healing or an irregular ridge, radiographs may be unnecessary. Such criteria need to be tested in clinical practice until there is a body of knowledge, based upon experience, which can either support or reject their appropriateness.

Selection criteria reflecting specific physical abnormalities or symptoms seem more

likely to generate information of benefit to patient management. For the vast majority of our patients, for whom screening radiography was performed, we concluded that these films were redundant since they provided no information that modified patient treatment. It is becoming increasingly clear that an edentulous mouth that is clinically normal should be accepted as such, and that patients with healthy mouths should not be exposed to unnecessary radiation simply to document their health. Δ

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Reprint requests to Dr. Kogon.

References

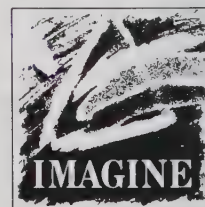
1. Brown, F.R., Shaver, J.W. and Lamel, D.A. The selection of patients for X-ray examination. *HEW Publication (FDA)* 80-8104, 1980.
2. Council on Dental Materials and Devices. Recommendations in radiographic practices. *JADA* 103:103-104, 1981.
3. Kantor, M.L. Radiographic examination of comprehensive care patients in U.S. and Canadian dental schools. *Oral Surg* 65:778-781, 1988.
4. National Center for Health Care Technology. Dental radiology: a summary of recommendations from the technology assessment forum. *JADA* 103:423-425, 1981.
5. Center for Devices and Radiological Health. The selection of patients for X-ray examinations: dental radiographic examinations. *HHS Publication (FDA)* 88-8273, 1987.
6. Council on Dental Materials, Instruments and Equipment. Recommendations in radiographic practices: an update, 1988. *JADA* 118:115-117, 1989.
7. American Association of Dental Schools. Curriculum guidelines for predoctoral oral radiology. *J Dent Educ* 51:254-259, 1987.
8. Ettinger, R.L. Roentgenographic evaluation of the edentulous patient. *Aust Dent J* 16:210-219, 1971.
9. Scandrett, F.R., Tebo, H.G., Miller, J.T. et al. Radiographic examination of the edentulous patient. Part 1 and Part 2. *Oral Surg* 35:266-274 and 872-875, 1973.
10. Perrelet, L.A., Bernhard, M. and Spirgi, M. Panoramic radiography in the examination of edentulous patients. *J Prosth Dent* 37:494-498, 1977.
11. Ritchie, G.M. and Fletcher, A.M. A radiographic investigation of edentulous jaws. *Oral Surg* 47:563-567, 1979.
12. Tronje, G., Bolin, A., Eliasson, S. et al. Panoramic radiography of edentulous jaws. 1. Frequency and distribution of pathological findings. *Dentomaxillofac Radiol* 9:21-25, 1980.
13. Alattar, M.M., Baughman, R.A. and Collett, W.K. A survey of panoramic radiographs for evaluation of normal and pathologic findings. *Oral Surg* 50:472-478, 1980.

14. Spyropoulos, N.D., Patsakas, A.J. and Angelopolous, A.P. Findings from radiographs of the jaws of edentulous patients. *Oral Surg* 52:455-459, 1981.
15. Jones, J.D., Seals, R.R. and Schell, E. Panoramic radiographic examination of edentulous patients. *J Prosth Dent* 53:535-539, 1985.
16. Keur, J.J., Campbell, J.P.S., McCarthy, J.F. et al. Radiological findings in 1,135 edentulous patients. *J Oral Rehab* 14:183-191, 1987.
17. Zarb, G.A., Bolender, C.L., Hickey, J.C. et al. *Boucher's prosthodontic treatment of edentulous patients*. Ed. 10. St. Louis, The C.V. Mosby Company, 1990, p. 67.
18. White, S.C., Forsythe, A.B. and Joseph, L.P. Patient selection criteria for panoramic radiography. *Oral Surg* 57:681-690, 1984.
19. Lloyd, P.M. and Gambert, S.R. Periodic oral examinations and panoramic radiographs in edentulous elderly men. *Oral Surg* 57:678-680, 1984.
20. Garcia, R.I., Valachovic, R.W. and Chauncey, H.H. Longitudinal study of the diagnostic yield of panoramic radiographs in aging edentulous men. *Oral Surg* 63:494-497, 1987.
21. Lyman, S. and Boucher, L.J. Radiographic examination of edentulous mouths. *J Prosth Dent* 64:180-182, 1990.
22. Herd, J.R. The retained root. *Aust Dent J* 18:125-131, 1973.
23. Garver, D.G. and Fenster, R.K. Vital root retention in humans: a final report. *J Prosth Dent* 43:368-373, 1980.
24. Barrett, A.P., Waters, B.E. and Griffiths, C.J. A critical evaluation of panoramic radiography as a screening procedure in dental practice. *Oral Surg* 57:673-677, 1984.

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Benign mucous membrane pemphigoid: A case report

Brahm A. Miller, B.Sc., M.Sc., DDS
Mervyn Gornitsky, B.Sc. DDS, FRCD (C)
Montreal

ABSTRACT

A relatively rare systemic disease, benign mucous membrane pemphigoid (cicatricial pemphigoid) usually starts in the mouth and is clinically characterized by bullae that rupture and form an ulcer. A distinctive Nikolsky's sign is apparent using gentle air blasts or finger pressure. The pharynx, larynx, nose, esophagus, genitals and eyes can also be affected. Involvement of the conjunctivae can lead to scarring and ensuing blindness.

The following case of a healthy 77-year-old man, diagnosed as suffering from mucous membrane pemphigoid, is of particular interest since several confusing clinical observations, including poor oral hygiene, the possibility of a contact dermatitis or an adverse antibiotic reaction, made the diagnosis more difficult. A careful medical history, examination and consultation process is paramount to initiating proper treatment and subsequent relief of symptoms. Benign mucous membrane pemphigoid must always be considered in any patient with desquamative epithelium of the oral mucosa.

SOMMAIRE

Le pemphigus oculaire (dermatite bulleuse) est une affection relativement rare qui naît dans la bouche et se caractérise par des lésions bulleuses formant ulcère. Au moindre souffle ou à une simple pression du doigt, la peau se décolle; c'est le signe de Nikolsky. Le pharynx, le larynx, le nez, l'oesophage, la muqueuse génitale et les yeux sont parfois atteints également. Lorsque la lésion atteint la conjonctive, elle peut provoquer l'aveuglement.

On présente ici un cas d'un intérêt particulier. Il s'agit d'un homme de 77 ans, en santé, dont on a eu du mal à diagnostiquer un pemphigus oculaire. On a d'abord cru à une mauvaise hygiène, à un eczéma de contact ou à une réaction adverse aux antibiotiques. Pour bien traiter cette maladie et en soulager les symptômes, il est essentiel de bien connaître l'histoire médicale du patient, de l'examiner avec soin et de con-



Fig. 1: A 77-year-old patient with desquamative gingivitis diagnosed as benign mucous membrane pemphigoid. Initial clinical appearance.

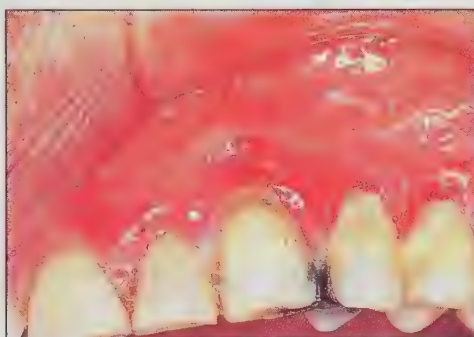


Fig. 3: Characteristic Nikolsky's sign after gentle air blasts.



Fig. 2: Bleeding and ulceration after finger rubbing.



Fig. 4: Five weeks after systemic prednisone and topical fluocinonide gel.

sulter qui de droit. On doit toujours soupçonner un pemphigus oculaire lorsqu'un patient est atteint d'un épithélium desquamatif à la muqueuse buccale.

Benign mucous membrane pemphigoid (BMMP) is a systemic disease primarily affecting middle-aged and elderly women. The cause is uncertain, although hormonal factors, ageing, metabolic disturbances and chronic infections have been suggested.¹ Poor oral hygiene can further aggravate the condition.² It invariably starts in the mouth and clinically presents as a fiery red gingiva covered by bullae that rupture and form ulcers. These features are similar to what has been called desquamative gingivitis, which today is considered to be either mucous membrane pemphigoid or erosive lichen planus.³ For the most part, these oral lesions heal without scar-

ring and the general health of the patient is not jeopardized. The disease can also affect the pharynx, larynx, nose, esophagus, genitals and the eyes. Involvement of the eyes can result in the scarring and shrinking of the conjunctivae, leading to a loss of vision,⁴ and therefore requires the assiduous attention of an ophthalmologist. Histological sections show intra- and subepithelial ulcers with inflammatory infiltrate without acantholysis.⁵ Marked improvement has been shown with the administration of corticosteroids⁶ and, more recently, with tetracycline treatment.²

Case report

A healthy, 77-year-old Caucasian male was referred to our dental clinic with an asymptomatic, red, inflamed ulcerative gingiva aggravated by the presence of inordinate amounts of tooth and gingival

marginal plaque. Finger massage and gentle air blasts produced a characteristic Nikolsky's sign with ulceration and bleeding (Figs. 1-3). The eyes appeared dry and red. A thorough medical history revealed that the patient had experienced a genital skin irritation two weeks prior to this, which had resolved with the use of a topical steroid cream.

The referring dentist informed us that the patient had recently undergone scaling with a light curettage, was prescribed penicillin and instructed to use a tooth brush and toothpaste to keep his teeth clean. Previous to this, the patient could not recall ever having brushed his teeth. Therefore, it was suggested that he could be experiencing an adverse antibiotic reaction to penicillin or an allergic contact stomatitis to toothpaste.

An incisional biopsy was performed with the following results. Direct testing (immunofluorescence (IF)) of lesional buccal gingiva showed a fibrillar and basement membrane staining with IgG, IgM and complement. Anatomical diagnosis indicated subepithelial cleavage with adjacent vacuolar change of basilar keratinocytes coupled with chronic inflammation.

An additional buccal mucosa biopsy specimen proved negative. These results are consistent with the diagnosis of mucous membrane pemphigoid. A blood CBC was non-contributory. An SMA analysis revealed somewhat elevated levels of urea, glucose and alkaline phosphatase; the significance of this to BMMP is not apparent. No ocular, genital or anal involvement was found. The patient was given prednisone, 15 mg/day and topsyn gel 0.05 per cent applied to the gingival area three times a day. During five weeks of corticosteroid treatment, a partial remission of the oral lesions was observed (Fig. 4).

In unusual circumstances such as this, where a healthy 77-year-old patient presents with a confusing clinical background, it is often easy to be sidetracked when searching for a definite diagnosis. A thorough consultation, careful medical history, coupled with a complete intraoral and extraoral examination and biopsy confirmation, are instrumental in identifying the underlying problem. Although rare, the possibility of BMMP must be considered in any patient with desquamative or bullous vesicular lesions of the oral mucosa or attached gingiva. Δ

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References

1. McCarthy, F.P., McCarthy, P.L. and Shklar, G. Chronic desquamative gingivitis: a reconsideration. *Oral Surg* 13:1300-1313, 1960.
2. Ronbeck, B.A., Lind, P.O. and Thrane, P.S. Desquamative gingivitis: Preliminary observations with tetracycline treatment. *Oral Surg* 69:694-697, 1990.
3. Peng, T., Nisengard, R.J. and Levine, M.J. Gingival basement membrane antigens in desquamative lesions of the gingiva. *Oral Surg* 61:584-589, 1986.
4. Domonkos, A.N., Arnold, H.L. and Odon, R.B. *Andrew's diseases of the skin. Clinical Dermatology.* Philadelphia, W.B. Saunders Co., 1982.
5. Sklavounou, A. and Laskaris, G. Frequency of desquamative gingivitis in skin diseases. *Oral Surg* 56:141-144, 1983.
6. Nisengard, R.J. and Rogers, R.S. The treatment of desquamative gingival lesions. *J Periodont* 58:167-172, 1987.

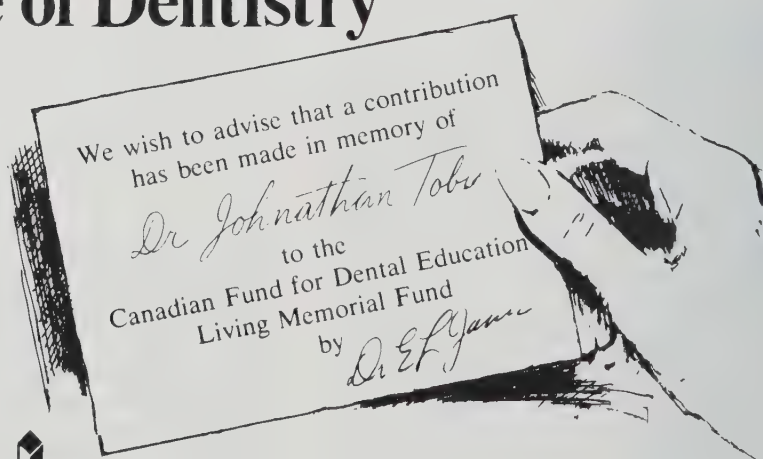
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March 8-12: The 15th Asian Pacific Dental Congress in Auckland, New Zealand. For registration forms, contact: New Zealand Dental Association, PO Box 28 084, Remuera, Auckland, New Zealand.

March 26-28: World Congress XII for Oral Implantology in Sydney, Australia. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

March 28-April 4: 29th International Alpine Dental Conference in Courchevel 1850, France. Contact: The International Dental Foundation, 53 Sloane St, London, SW1X 9SW, England.

April/Avril 1992

April 6-11: 25th International Dental Show in Cologne, Germany. For information, contact: Verband der Deutschen Dental Industrie e.V., Pipinstrasse 16, W-5000 Köln 1, Germany.

April 8-12: XI International Conference on Oral and Maxillofacial Surgery in Buenos Aires, Argentina. For information and registration, contact the Secretariat at the following address; XI ICOMS, Casilla de Correo 4437, 1000 Correo Central, Argentina.

April 29-May 3: 8th Annual Scientific Sessions of the American Academy of Cosmetic Dentistry in Palm Springs, Calif. For more information, contact: Barbara Jo Zoelle, The American Academy of Cosmetic Dentistry, 2711 Marshall Ct, Madison WI 53705. Tel: (608) 238-6529.

November/Novembre 1991

November 27-30: XIIth International Dental Film and Video Festival in Paris. Enrolment deadline February 15, 1991. Enquiries: Dr. M. Dolovici, XIIèmes Journées 1991, 92 av. de Wagram, Paris, France. 33 1 42.27.89.00.

November 27-30: International Congress of the French Dental Association in Paris. For more information, write: ADF, 92, av Wagram, 75017 Paris, France.

November 30-December 5: Greater New York Dental Meeting in New York City. For details, contact: Greater New York Dental Meeting, 1700 Broadway, 4th floor, New York, NY 10019-5905. Tel: (212) 581-6611.

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January 11-12: ACOI Winter Seminar: Live Implant Surgery Utilizing Blades in Phoenix, AZ. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

January 25-February 1: 28th International Alpine Dental Conference in Courchevel 1850, France. Contact: The International Dental Foundation, 53 Sloane St, London, SW1X 9SW, England.

January 29-February 1: Miami Winter Meeting 1992 A Journey to Synergy at the Hyatt Regency Miami. For further information, call (305) 667-3647 or (305) 944-5668.

February/Février 1992

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February 12-16: Annual Convention of the Jamaica Dental Association in Ocho Rios, Jamaica. For further information on registration, contact: Dr. Keith Williams, Chairman, Convention Committee, 8 Melmac Ave, Kingston 5, Jamaica, WI. Tel: (809) 92-68209.

February 16-19: 127th Annual Midwinter Meeting of the Chicago Dental Society. Contact: Chicago Dental Society, 401 N. Michigan Ave, Suite 300, Chicago, IL

60611-4205, USA. Tel: (312) 836-7300. Fax: (312) 836-7337.

February 22-29: Virgin Islands Dental Association Convention. For convention pre-registration (limited), travel and accommodation at group fares, please contact: Lynne Brandon CDA, 85 Lonsdale Dr., London, Ont N6G 1T4. Tel: (519) 657-4306 (evenings).

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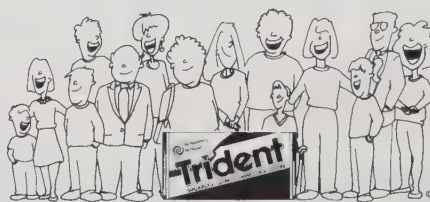
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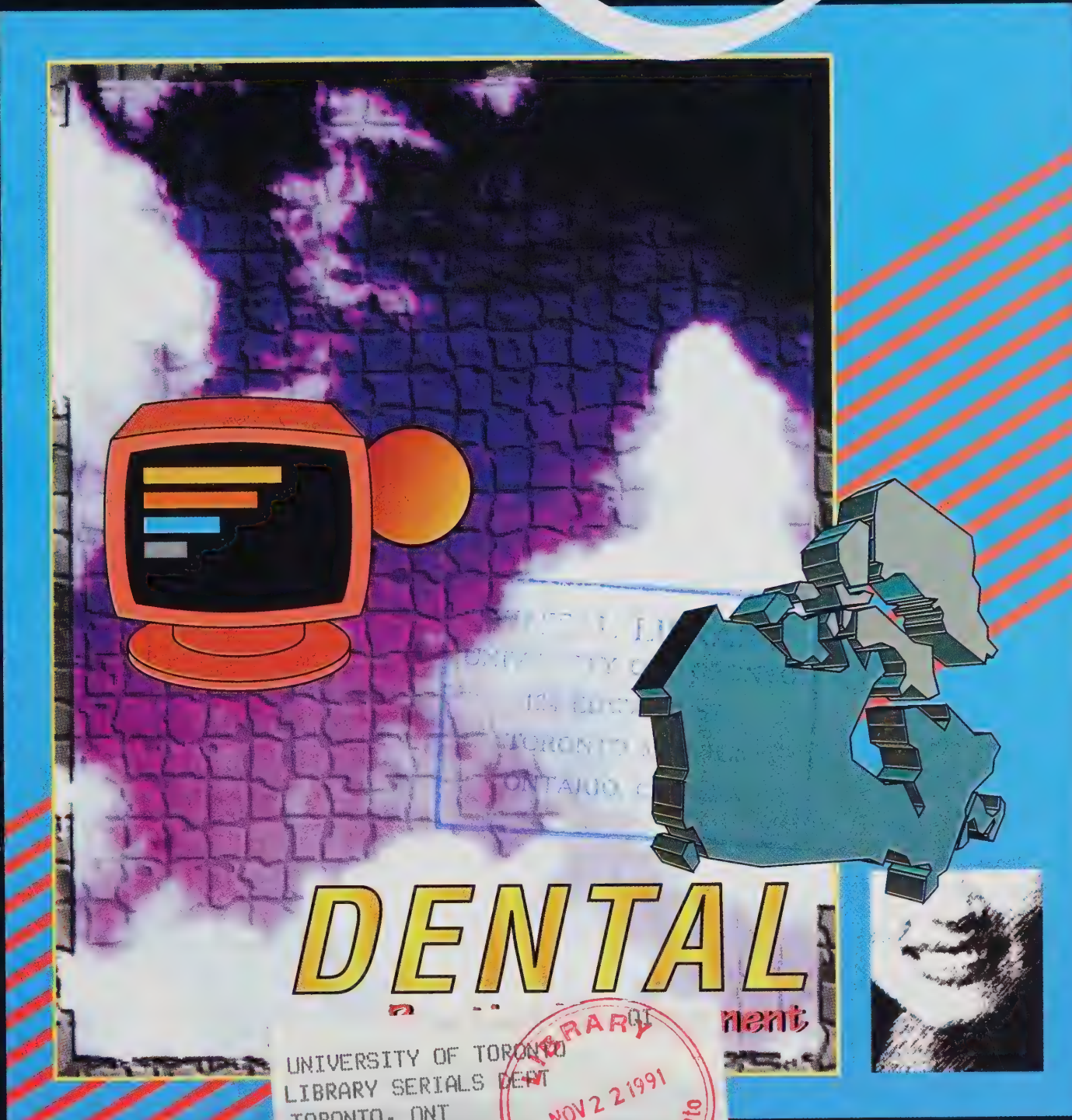
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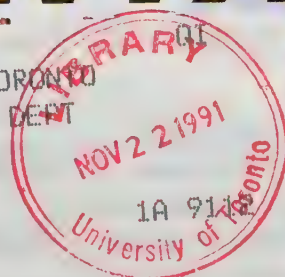
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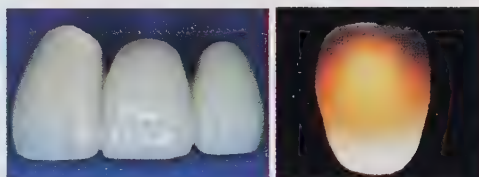
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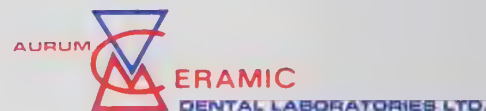
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November 1991

Vol. 57 No. 11

Practice Management

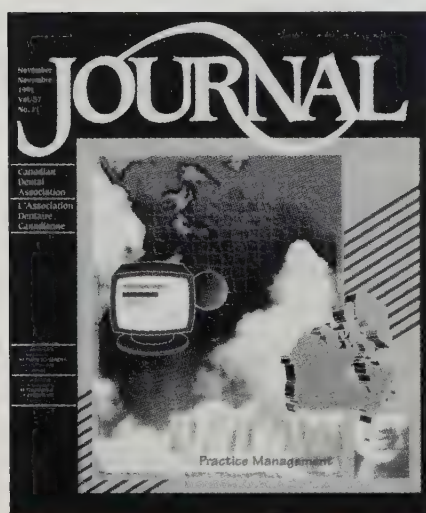
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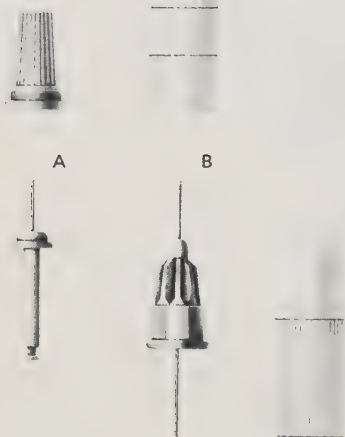
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THE BUSINESS OF DENTISTRY

As the *Journal's* readers look at this month's cover illustration, scan the table of contents and read the related articles, they will no doubt notice the emphasis we've placed on practice management. Some of you may feel that our coverage of the topic in this issue of the magazine, and even in previous issues, was too extensive, or a bit "much." You may even be asking yourselves if the *Journal* should be promoting the business of dentistry at all.

We take no credit for originality or innovation. Literally every dental publication has, at some time or other, dealt with money, administration and management. In fact, when we checked the very first dental journal ever published in Canada, *The Canadian Journal of Dental Science*, edited by W. Geo Beers and C.C. Chittenden, we found an 1871 article titled "Dentistry vs. Money." If we had included the article in this month's *CDA Journal*, I suspect that only a few of you would have remarked on the fact that it was 120 years old.

When the *Journal of the Canadian Dental Association* – Canada's first peer-reviewed journal – was founded in 1935, the first volume contained articles on collections, recalls and advertising. A quote from a 1935 article, "Dollars and sense in denture construction," expresses ideas that are remarkably similar to those expressed by the current edition's authors.

"Surely, both patient and operator can meet on some common ground where the patient can choose a service in keeping with his ideas and pocket-book, and still give the operator a proper remuneration for the degree of service rendered."

The point we are trying to make is that it is virtually impossible to separate the practise of dentistry from the business of dentistry. Somehow, somehow, the rent has to be earned, staff paid and food placed on the table. The only way these basic truths of dentistry can be bypassed was expressed in a recent comment made by a confrere.

"I would just love to win the 649 lottery," he said. "Then I could practise dentistry just for the love of it and not have to worry about paying bills."

The business of dentistry has taken different twists and turns as it wound itself through the decades. We remember well a conversation with the founding editor of this *Journal*, Dr. Harry Garvin, who began his practice in 1903, well before the "temporary" Income Tax Act was passed in 1917. He told me that things were very simple in the early days of his practice, when he dispensed with financial matters from three pockets. There was one for the practice, one for himself and one for his church.

But Dr. Garvin and thousands of dentists like him also remember other, terrible years – the "dirty thirties" – when they bartered dental care for chickens, eggs and honey.

Even with the passing of the depression years, operating a dental practice could involve severe limitations. Great numbers of Canadian dentists closed viable practices to go to war, only to have to start all over again when they returned home. There were no high speed drills, no carbides,



Dr. Ralph Crawford

no diamonds, no fluoride and no dental insurance. In fact, CDA made history in 1954 when it initiated the establishment of voluntary pre-payment plans.

The 1956 issues of the *Journal* contained numerous articles on dental business. One editorial dealing with the growth of group practices stated: "It seems even startling that almost without knowing it the view is accepted commonly now in the business world that the individual has little meaning except as a member of a group." Another editorial dealt with "A fee schedule – pro or con," and the problems

created when government agencies demanded fee schedules for administrative purposes.

Last month, when the *Journal* interviewed Dr. Les Allen, CDA's president, he recalled the "Golden Years" of dentistry. He was referring to the 1960s and '70s, when the economy was booming, dental science and technology were burgeoning and dental faculties were building – five new ones in Canada within a decade.

One of my fellow graduates in the mid-1960s was overheard to say, jokingly, but with an element of truth, "I am going to put on a blindfold and throw a dart at a map of the city. Wherever it lands, I will open an office and the patients will kick the door down to get at me."

It is interesting to reflect that the more dentistry succeeded, over the years, the more difficult the business of dentistry became. The advent of fluoride, emergence of dental insurance, improvements in dental technology, increasing numbers of dentists and the public's growing awareness of good oral health, have combined to create a "busyness" problem. Who would have believed that there would not be enough patients to go around or that university administrators would be proposing the closure of dental schools?

And the business of dentistry is more confusing than ever before. The three-pocket management technique once espoused by Dr. Garvin is no more. Today there are more pockets than can be counted – provincial tax, federal tax, GST, an endless amount of insurance for self and patient, RRSPs, and management companies – just to list a few. It is no wonder that dentists are requesting more and more business information.

Increasingly, they seek out practice management information and literature at dental conventions, and place it at the top of their reading lists. This is not a selfish gesture geared toward making more money, but a cry for all the help they can get to unravel the complexities of the business of dentistry.

A comment made by J.M. Ritchie in a speech to the Toronto Forum of Dental Practice Management on March 11, 1935, still rings true today: "My idea as regards the management of a dental practice is that the department of accounts should receive as careful thought and forethought as the carving of an impression for an oral restoration."

P. Ralph Crawford, BA, DMD

Editor: *Journal of the Canadian Dental Association*

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maximum of \$6,000 per month.

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met by the protection of Office Overhead Expense Insurance put the future of your practice in jeopardy.

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President's Column

A LABOR OF LOVE

It's summertime in old Quebec. The sun shines in a cloudless sky, a gentle breeze is blowing, leaving a scent of history in its wake, and the people strolling along the sidewalks seem to exude warmth and friendliness. CDA could not have chosen a better locale, nor a better time of year, to hold its 1991 convention.

Before I became active on CDA's board of governors, I would have spent a good portion of my time in Quebec enjoying the fabulous weather, the scenery and the city's wonderful food. To me, and many of my confreres, good times, fancy restaurants and sight seeing were part and parcel of what a good convention was all about. Yes, we cared about the lectures and meetings, and spent hours touring the exhibits and talking to colleagues, but conventions weren't all work and no play.

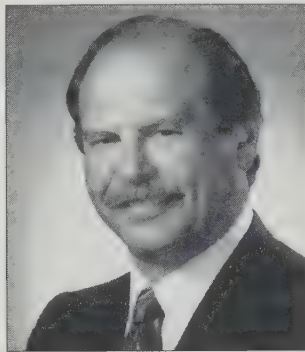
In those days, I didn't realize the amount and extent of work that goes on behind the scenes at a convention. Now I do. By the end of convention week this year, several members of the executive and management committees of CDA were raising weary heads to look at one another and ask how we could lighten the load or spread out the schedule.

For us, the convention began on Wednesday with a management committee meeting, followed by two very successful days with the board of governors. Sunday and Monday were taken up by the certification conference, which was shortened on the Sunday to allow everyone to attend the convention's absolutely fabulous opening ceremonies.

Throughout the convention, many hours were spent meeting with other national groups such as the Canadian Dental Hygienists' Association, the Canadian Dental Assistants' Association, the management of CDSPI and the provincial corporate bodies – each of which had specific concerns to discuss.

I remember the days, several years ago, when board meetings tended to get bogged down on small details. We seemed to spend hours debating the wording of resolutions, or how we could do one thing without affecting another. But CDA has grown and matured since then. Today, I am impressed and pleased by the high level of preparation being demonstrated by the members of the board. The debate is much more meaningful and to the point. The issues are more complex.

This year, the board of governors dealt at length with the issue of HIV infection as it relates to health care workers and patients. The debate began with a review of the recommendations that emanated from the CDA-sponsored conference on "The Impact of HIV and Other Infectious Agents on Oral Health Care" last April, and ended with a resolution to approve an even stronger set of infection-control guidelines.



Dr. Les Allen

In effect, the new guidelines say that dentists should inform their licensing authority of **any** incapacity that prevents them from treating patients effectively or safely, while the licensing authorities should ensure that mechanisms are in place to counsel affected dentists.

On the sensitive issue of mandatory testing and patient disclosure, the board directed CDA to review the current policy and to consult with CMA, Health and Welfare Canada and other related bodies. This review will allow CDA to fully assess the new exposure-prone procedures classification put forward by the Centers For Disease Control.

But the board didn't spend all its time debating the best strategy to deal with the impact of HIV. It also gave final approval to the "new" Code of Ethics. Written in an easy-to-read format, the code deals with the four essential responsibilities of the ethical practitioner – the responsibility to patients, to the public, to the profession and to colleagues. Plans are now proceeding for the printing and distribution of the code.

Other highlights of the board meeting included a healthy and informative debate on the certification of dentists, an issue which was on the agenda at the first meeting of CDA in 1902.

A recent decision by the Royal College of Dental Surgeons of Ontario to admit 46 graduates of U.S. dental schools to practice in Canada without an NDEB examination has put this issue back in the spotlight. But the board's debate on certification was just that, a debate. The development of conclusions and recommendations was left to the Conference on the Certification of Dentists in Canada, held two days after the CDA board meeting, which was attended by representatives from licensing bodies, associations, universities and the NDEB.

On the issue of environmental protection, the board gave approval in principle to several sections of a new policy on the management of hazardous materials in the dental office. Approved are Part I, the Identification and Management of Hazardous Waste, and Part II, Transportation of Dangerous Goods. With the completion of Part III, Management of Hazardous Wastes, in 1992, a national set of guidelines will be available for dental offices from coast to coast...

Outside, as the debate continued, the sun still shone brightly, the history of old Quebec sighed in the breeze, and the people on the streets continued to be helpful and friendly – or that's what everybody told us. Inside, the future of organized dentistry was hammered out over a gruelling week of discussion and debate. And for me, that's what this convention was really all about.

*Les Allen, B. Comm., DMD
President of the Canadian Dental Association*



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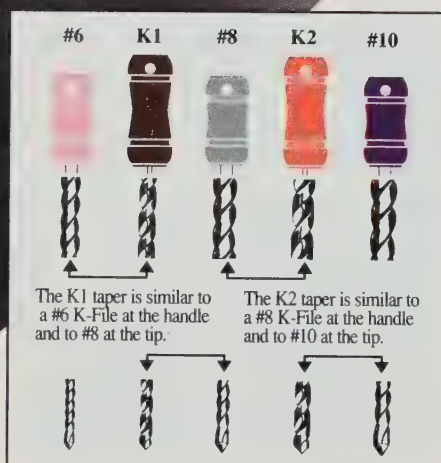
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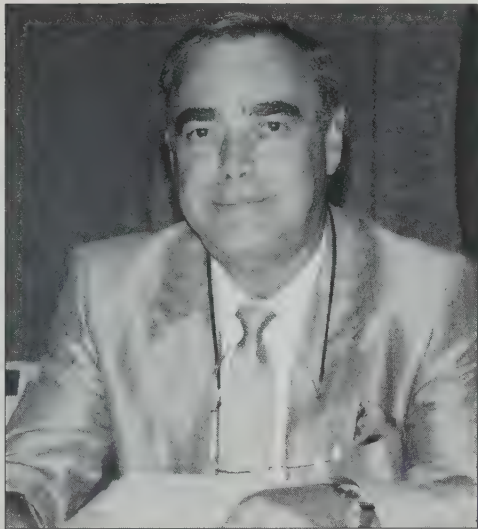
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News Update

Dr. W.R. Bedford Retires



Dr. W.R. "Bill" Bedford

Dr. W.R. "Bill" Bedford, Health and Welfare Canada's senior consultant, dentistry, retired on September 27, 1991.

Based in Ottawa, Dr. Bedford has represented Health and Welfare Canada on the CDA board of governors since 1981. During those 10 years he served on a variety of CDA committees.

At his final board of governors meeting last August, Dr. Bedford outlined the department's innovative Dental Claims Processing System, which he was instrumental in developing. The new national system is part of the Non-Insured Health Benefits (NIHB) Program established by the Medical Services Branch of Health and Welfare Canada. Under the program, Native Canadians are entitled to receive medical and dental services not covered by provincial, territorial or third-party agreements (see *Communiqué*, October, 1991).

Dr. Bedford graduated from the faculty of dentistry at the University of Toronto in 1958. He spent the next 15 years (1959-1974) in private practice in Richmond Hill, Ontario, before joining the staff at the National School of Dental Therapy.

In 1976 Dr. Bedford joined Health and Welfare Canada's Medical Services Branch as the regional dental officer in Manitoba, where he remained until 1981. During that time (in 1978) he received a diploma in dental public health from the University of Toronto. He moved to Ottawa to become Health and Welfare's senior consultant, dentistry, in 1981.

Dr. Bedford played an active role in international dentistry, serving first as

consultant to the commission on health, research and epidemiology at the Fédération Dentaire Internationale (FDI) level, and recently retired as chairman of FDI's world chief dental officers meeting.

Dr. Terry Carlyle Elected President Of Canadian Association Of Orthodontists



Dr. Terry Carlyle

Dr. Terry Carlyle was elected president of the Canadian Association of Orthodontists during the group's 43rd annual scientific meeting, held in Quebec City, August 22-24, 1991.

A private practitioner based in Edmonton, Dr. Carlyle was awarded his DDS degree from the University of Alberta in 1973. He then pursued graduate training in orthodontics at the University of Manitoba, graduating in 1977.

The other officers elected by the association are: president-elect, Dr. Michael Farmer, Montreal; first vice-president, Dr. Michael Wainwright, Vancouver; second vice-president, Dr. Lee Erickson, Dartmouth, N.S.

The association's next annual scientific meeting will be held in Calgary in conjunction with the CDA Convention, August 28-30, 1992.

Ash Temple Supports Canadian ISO Delegation



Mr. Michael Hart (right), president of Ash Temple Ltd., presents \$3,000 to Dr. Ted Ramage, CFDE chairman, in support of a Canadian delegation to the October 1991 ISO meeting in Italy.

Ash Temple Limited has contributed \$3,000 in support of the Canadian delegation to the International Standards Organization (ISO) meeting, held in Italy October 14-19, 1991.

The ISO advocates an international standards system for all dental materials and devices.

Ash Temple donated the \$3,000 to the Canadian Fund for Dental Education (CFDE), which passed the funds on to the Canadian delegation to the ISO meeting. In his letter to CFDE, Mr. Garry Jarvis, the vice-chairman of Ash Temple Ltd., said, "This cheque reflects our commitment and concerns for the lack

Errata

In the story "Dr. Phil Greeves Named Alberta President," which appeared in the News Update section of the September 1991 *Journal*, it was stated that Dr. Greeves had been active on convention committees in Manitoba. In actual fact, Dr. Greeves has been active on convention committees in Alberta. An editing error led to this mistake. The *Journal* regrets the error.

An article that appeared in the News Update section of the September 1991 issue of the *CDA Journal* may have been misleading. The article ran under the headline "McGill Faculty of Dentistry to Close." In fact, as the text of the article made clear, the university is considering a proposal to close its faculty of dentistry, and hasn't taken a final decision on the future of its dental school.

of government funding in this very important area. The amount is paid out of our "equity fund," which provides financial support of dental excellence through our universities and associations."

P.E.I. Dental Association Celebrates Centennial

The Dental Association of Prince Edward Island marked the 100th anniversary of the Island's Dental Act during its recent annual meeting, held at Rodds Mill River Resort in O'Leary.

There were only seven dentists in P.E.I. when the act was enacted in 1891. Its passage was secured primarily through the efforts of one man – Dr. John S. Bagnall, the father of Dr. J. Stanley Bagnall, who became the dean of the faculty of dentistry at Nova Scotia's Dalhousie University.

Jeffrey Simpson Presents Murray McDonald Memorial Lecture



Mr. Jeffrey Simpson (left), is congratulated by Dr. Ted Ramage, CFDE chairman, at the conclusion of the Murray McDonald Memorial Lecture.

Jeffrey Simpson, a renowned *Globe and Mail* columnist and, until recently, a fixture on CBC's *Sunday Report*, presented the Murray McDonald Memorial lecture during CDA's annual convention, held August 24-28 in Quebec City.

The lecture, which has been an annual highlight at the CDA convention since 1985, is made possible through a Canadian Fund For Dental Education (CFDE) trust established in memory of



The executive of the Dental Association of Prince Edward Island – celebrating 100 years of "Island" dentistry. Left to right: Dr. Ray Wenn, CDA vice-president; Dr. Dan Coffin, president; Dr. Paul McCarville, past-president; Dr. Michael Connolly, secretary-treasurer; Dr. Colin Jack, executive member; Dr. Stuart MacDonald, executive member. Missing from the photo is Dr. Brian Barrett, registrar.

Mr. Murray McDonald, the executive director of CFDE from 1967 until his death in 1984.

Mr. Simpson's lecture, "Canada at the Crossroads," dealt with many of the problems facing the nation today – the Charter of Rights, the Constitution, the courts – and its involvement in globalization.

"The problem with Canadians," said Mr. Simpson, "is that we define in negatives. We know who we are not – we don't know what we are...Canadians view the Constitution like a huge mirror, they want to see their values reflected in the mirror."

CDA Honors Distinguished Members

At an impressive luncheon ceremony during its annual convention – held in Quebec City August 24-28 – CDA honored some of its most distinguished members.

Honorary Membership

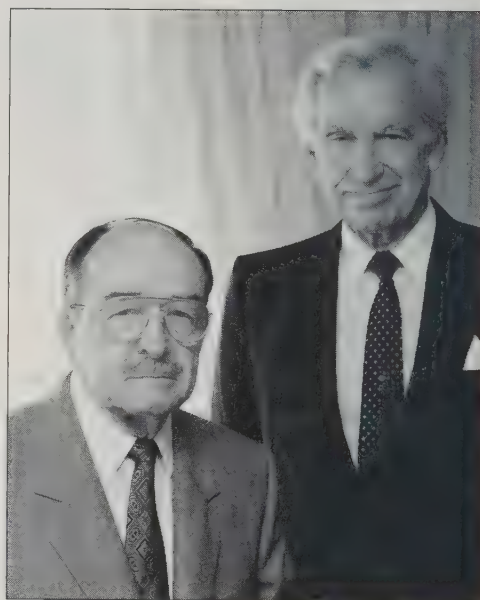
Honorary Membership is the highest award of the association. Its purpose is to recognize individuals deemed to have made outstanding contributions to the art and science of dentistry, or to the dental profession, over a sustained period of time.

Dr. Wesley Dunn

Dr. Wesley Dunn was editor of the *CDA Journal* from 1953-1958, and the registrar-secretary-treasurer of the Royal College of Dental Surgeons (RCDS) of Ontario from 1956-1965. He

served as the president of RCDS from 1989-1990.

When the University of Western Ontario's dental faculty was founded in 1965, Dr. Dunn was appointed dean and served in that capacity until 1982. He was a founding director of Canadian Dental Service Plans Inc. (CDSPI) in 1959 and served on its executive until 1965. He has also served on innumerable university, government and community committees.



Dr. Wesley Dunn (right), and Dr. Jean-Paul Lussier, (left).

Dr. Jean-Paul Lussier

Dr. Jean-Paul Lussier was awarded a DDS from the Université de Montréal in 1942, and earned his MS from the same school in 1952. He subsequently earned his PhD from the University of California in 1959.



*Dr. Richard Rayman
Willowdale, Ontario*



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in addition to their usual oral hygiene), your patients can reduce plaque and gingivitis by as much as 34%^{1,2,3,4} over brushing alone. ■ Do you still need more proof? Listerine is the leading over-the-counter rinse to have earned the American Dental Association Council on Dental Therapeutics' Seal of Acceptance for proven antiplaque/antigingivitis efficacy.⁵ ■ We're not kidding ourselves. Convincing your patients to fight plaque and gingivitis is clearly an uphill battle. But Listerine may just give them the push they need.

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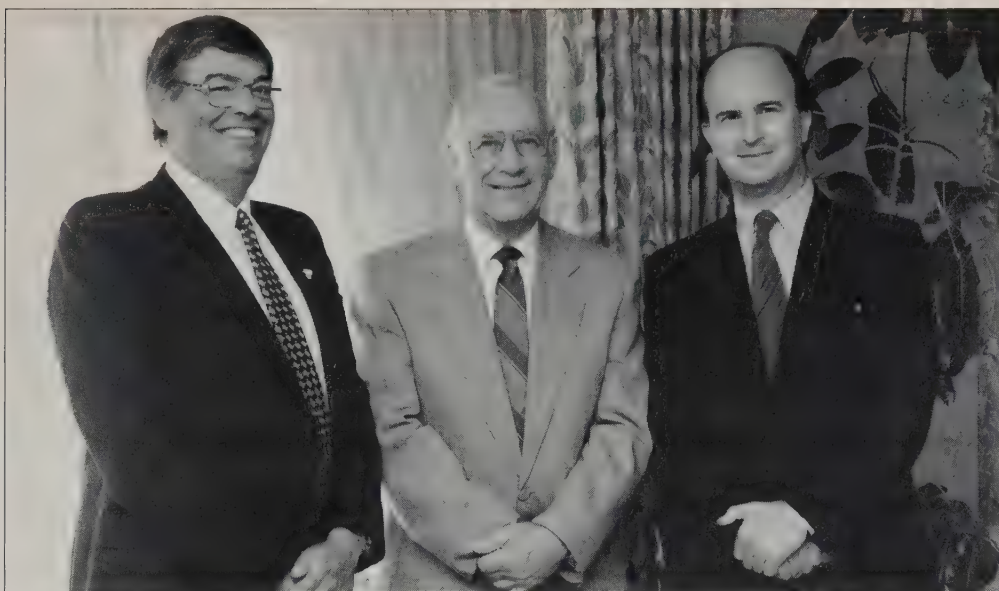


"Listerine has been shown to help prevent and reduce supragingival plaque accumulation and gingivitis when used in a conscientiously applied program of oral hygiene and regular professional care. Its effect on periodontitis has not been determined."

**COUNCIL ON DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION.**

REFERENCES: 1. Lamster J.B. et al. CLIN. PREV. DENT. 3:42-46, 1983. 2. Gordon J.M. et al. J. CLIN. PERIODONTOL. 12:697-704, 1985. 3. DePaola L.G. et al. J. DENT. RES. 16:341-345, 1989. 4. Overholser D. et al. J. CLIN. PERIODONTOL. 17:575-579, 1990. 5. Council on Dental Therapeutics Accepts Listerine. J. AMER. DENT. ASSOC. 117:515-516, 1988.





Distinguished Service Awards: (From left to right) Dr. John Gillies, Dr. John Durran and Dr. George Zarb. Missing from photo, Dr. Kenneth Pownall.

Dr. Lussier was the dean of the Université de Montréal's dental faculty from 1958 to 1983. He served as the director of the department of preventive/community dentistry for the faculty from 1965-1975, and was the chairman of its health sciences committee from 1979 to 1983.

Distinguished Service Award

The Distinguished Service Award is given to a dentist or layman to recognize either an outstanding contribution in a given year or outstanding service over a number of years. It may also recognize outstanding contributions to the dental profession at the corporate, specialty society, council or committee level.

Mr. John Gilles

Mr. John Gilles, who earned a BA from Waterloo Lutheran University, has been executive director of the Ontario Dental Association since 1974. As an active member of the Canadian Society of Association Executives, Mr. Gilles has served on the society's board level and certification council.

Dr. John Durran

Dr. John Durran graduated from the University of Toronto in 1953 and has been in private practice in Hamilton, Ontario, ever since. He has served in executive capacities at both the Hamilton and Ontario dental association levels and was president of CDSPI from 1974 to 1990.

Dr. George Zarb

Dr. George Zarb has been associated with the faculty of dentistry at the University of Toronto since 1963 and the chairman of the school's department

of prosthodontics since 1971. In addition to his many contributions to the literature, he has lectured extensively in the field of prosthodontics. He was instrumental in introducing the Bråne-mark osseointegration system to North America.

Dr. Kenneth Pownall

Dr. Kenneth Pownall is a 1951 graduate of the University of Toronto. Over the years he has served at board levels with the West Toronto Dental Society, the Toronto Academy of Dentistry, and the Ontario Dental Association. He recently retired as registrar-secretary-treasurer of the Royal College of Dental Surgeons of Ontario – a position he held for 25 years.

The Award of Merit

The Award of Merit is conferred upon a CDA member who has served in

an outstanding capacity in the governing of the association or made a similar outstanding contribution to Canadian dentistry.

Dr. John Eisner

Dr. John Eisner is a 1968 graduate of the school of dentistry at the University of Alberta. He subsequently earned his PhD in education from the University of Michigan.

In 1979, Dr. Eisner joined the community dentistry division at Dalhousie University. He is currently an associate professor in behavioral sciences at the University of Buffalo, and has been instrumental in the development of a curriculum data base applicable to dental education throughout North America.

Dr. John Hardie

Dr. John Hardie received his BDS from Glasgow University and a M.Sc. from the University of Western Ontario. Before moving to his present post as head of the department of dentistry for Vancouver General Hospital, he served as an oral pathologist at the Ottawa Civic Hospital. Dr. Hardie has lectured and contributed to the literature extensively, particularly in the area of infection control. He has served as CDA's infection control consultant for the past three years.

Dr. Gérard de Montigny

Dr. Gérard de Montigny graduated from the Université de Montréal in 1934 and obtained his master's degree from Northwestern University in Chicago. Until recently, he maintained a private practice in oral surgery in Montreal.

Appointed French editor for the *CDA Journal* in 1946, he served in that



Award of Merit: (From left to right) Dr. John Eisner, Dr. John Hardie, Dr. Gérard de Montigny and Dr. Pierre Desautels.

post for 18 years. For many years, Dr. de Montigny translated the entire text of the CDA transactions that occurred at the annual meeting of the board of governors.

Dr. Pierre Desautels

Dr. Pierre Desautels holds a DDS from the Université de Montréal and an MSD from Indiana University. He has been very active in dental materials and standards organizations at both Canadian and international levels. In addition, he has been a member of various CDA committees for the past 20 years, notably: dental materials and devices, dental research, and education.

Dr. Desautels has served on the editorial board of the *CDA Journal*, and has been the magazine's French-language scientific editor since 1981.

Dr. Derek Jones

Dr. Derek Jones is the assistant dean for research and the acting chairman of the department of applied oral sciences, as well as the head of the division of dental biomaterials science, with the faculty of dentistry at Dalhousie University.

Recognized as an authority on dental materials, Dr. Jones has lectured and contributed to the literature extensively. He is currently the chairman of the Canadian Standards Association technical committee on dentistry, and the chairman of the Canadian advisory committee to the International Standards Organization.

DID YOU KNOW ?

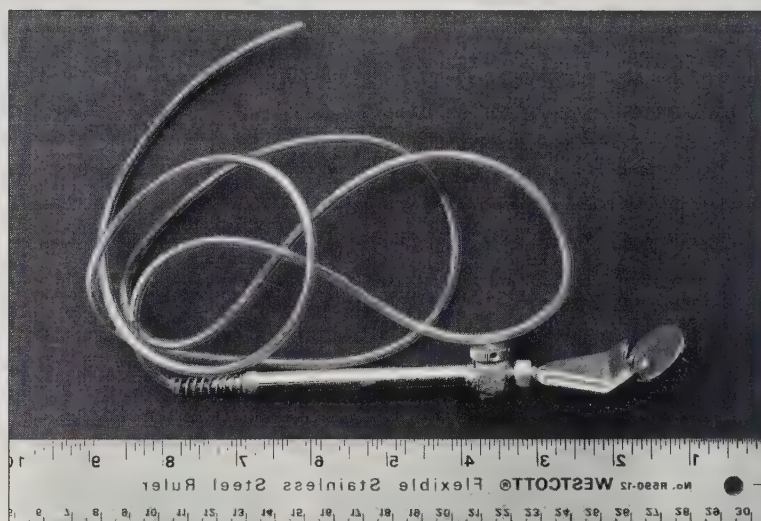
Conversation between two fishermen

"Hiyamac.
Lobuddy,
Benearlong?
Cuplaours.
Ketchameny?
Goddafeu.
Kindrthey?
Piknpickl.
Ennysizteum?
Cupplapouns.
Hittenhard?
Sordalite.
Wahuoozin?
Gobbawurms.
Fishnonaboddodm?
Rydonnaboddodm.
Igodago. Tubad.
Seeyaroun.
Yatakidezy.
Guluk."



"WHAT'S IT" THIS MONTH'S MYSTERY

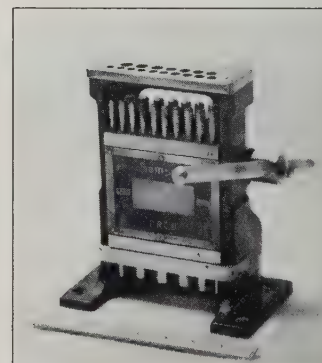
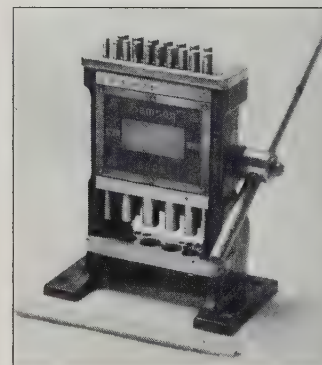
We think this apparatus was used to help keep a mirror dry. Can any of our readers give us first hand experience on exactly how it worked? If you know the answer to this month's mystery, please contact Dr. P. Ralph Crawford, *Journal* Editor, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6



August "What's It" Solved

Thanks to Dr. D.A. DuCasse, Willowdale; Dr. John R. Vaughan, Halifax; Dr. Ricardo Schwedhelm, West Vancouver; Dr. Kenneth Wallace, Edmonton; Dr. Anne Dale, Toronto; Mr. Ron Klausz, Toronto and Dr. B. Smith-Windsor, Indian Head, Saskatchewan, for identifying a **Precision Dental Shell Machine, circa 1910.**

The mechanism was used to construct swaged or shelled crowns out of thin sheets of gold or alloy. The shells were then swaged over custom dies and hammered into the shape of a pre-measured tooth.



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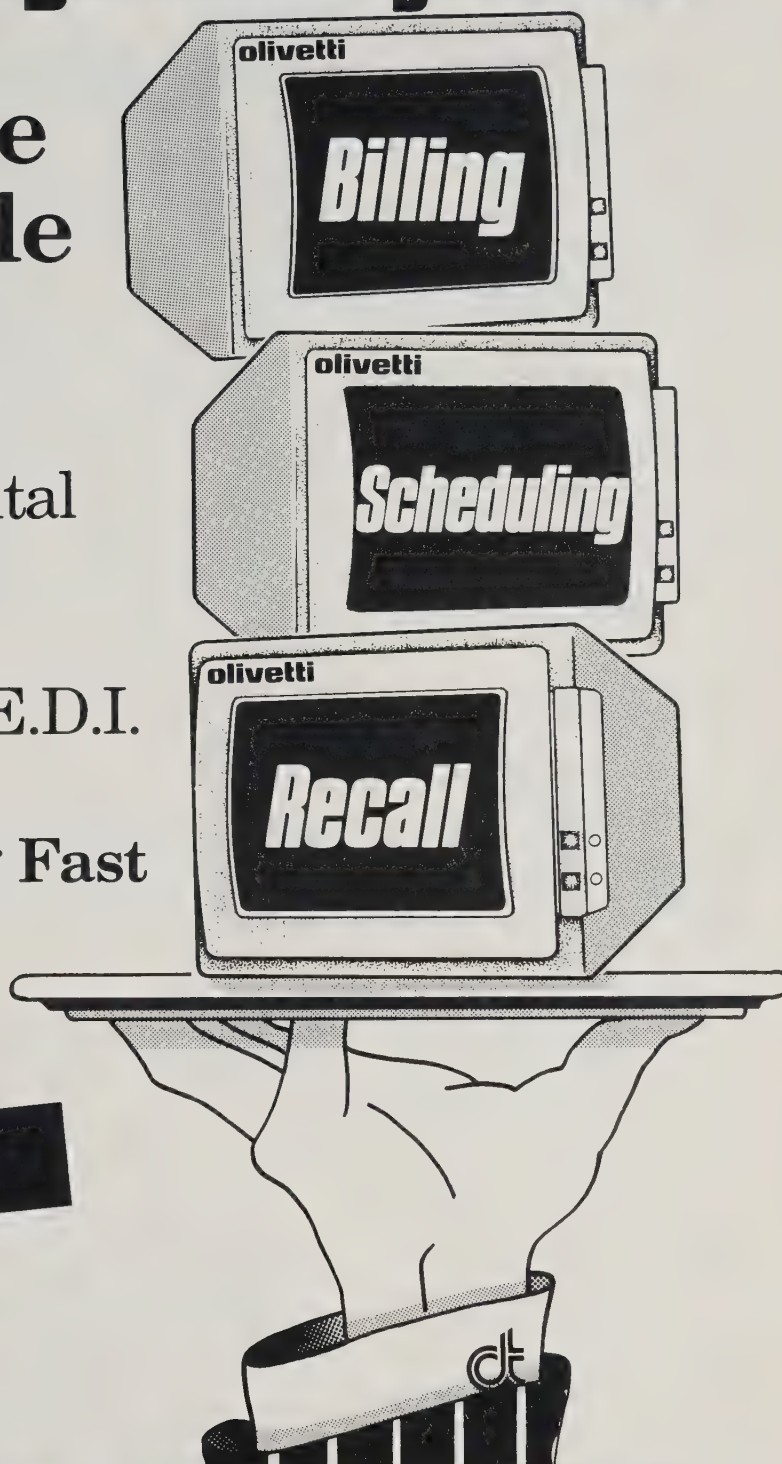
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Library/Bibliothèque

New Reference Service Planned

In an effort to make resource material easier for Canadian dentists to access, the CDA Library will launch a computerized reference service next year.

The library's entire collection of books, journals, reports and articles is now being entered into a database that dentists will be able to access on a computer to computer basis. Once it is complete, the database will also include information on dental conferences and seminars, among other things.

Initiated this spring with financial assistance from the Canadian Dental Foundation, the library automation plan will allow any dentist with access to a personal computer and modem to make use of the new library database. Once a link is made with the CDA Library's computer, the dentist can search for information by either subject, author or title.

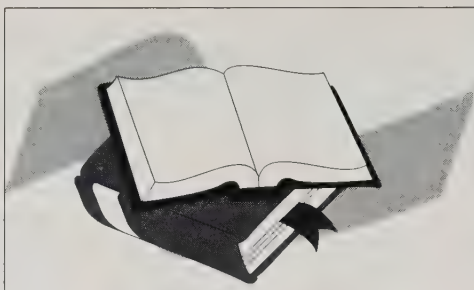
Borrowing materials from the library is also fast and simple, thanks to a new electronic message system.

Access to the database and its various information retrieval options will be available as a "value-added" feature on the CDAnet network. CDAnet, dentistry's electronic data interchange system, is available through CDA.

The introduction of the new database has not stopped the library from continuing to improve and enhance its more traditional services. The MEDLINE database, which contains hundreds and thousands of references to dental articles and reports, is still available through the CDA Library. And, in an average week, the library staff undertakes over 25 individual information searches for Canadian dentists, on topics ranging from dental practice management to general medical problems.

Through a MEDLINE computer search, dentists can obtain recent and retrospective information on developments in AIDS/HIV research or prevention; infection control; mercury amalgam; tooth whiteners; geriatric, pediatric and esthetic dentistry; and any other area of concern. These searches are free to CDA members, and available to non-members for a reasonable fee.

Each month, the library assembles a series of current articles on different subjects of interest to dentistry. Each series, known as a "Package Library," has become valuable, sought after read-



ing material in hundreds of dental offices. For a list of the packages currently available, dentists should contact the library.

In response to the popular appeal of videos, the library has started its own "video collection." Videos, like books and reports, are available for loan to CDA's dentist members. Dentists who would like to suggest videos that would be suitable for this collection are asked to contact the library.

Keeping up with developments in dentistry can be time consuming and expensive, but the services offered by the CDA library allow dentists to scan the literature and keep up to date at a fraction of what it costs to subscribe to dental journals.

The library's "Table of Contents" service, which is available each month, includes the contents pages of over 60 dental and health journals. By selecting 10 articles each month, dentists can in-

crease their knowledge base easily and quickly. And, because the library picks up the cost of subscribing to the journals included in the service, its cost is minimal.

For the past 40 years, the CDA Library has been expanding and improving to ensure that dentists have access to the latest information on dental research and techniques. Our mandate is to provide excellent service to CDA members. The library, and all the services it provides, belongs to you.

To take advantage of the services offered by the CDA Library, phone Martha Vaughan at: 523-1770 (Ottawa), 1-800-267-6354 (western Canada and area code 709), 1-800-267-6364 (eastern Canada except area code 709).

NOVEMBER PACKAGE LIBRARY

The library package for the month of November will be **Planning for Retirement**. This package can be obtained by calling the library.

It is available for \$5 to members and \$10 to non-members. The library packages are composed of over 18 current articles and studies relevant to the designated topic.

What does a phone call to the CDA Library get you?

- Computer searches
- Package Libraries
- Articles; Bibliographies
- Books, Videos, Reports, Tables of content



Information!

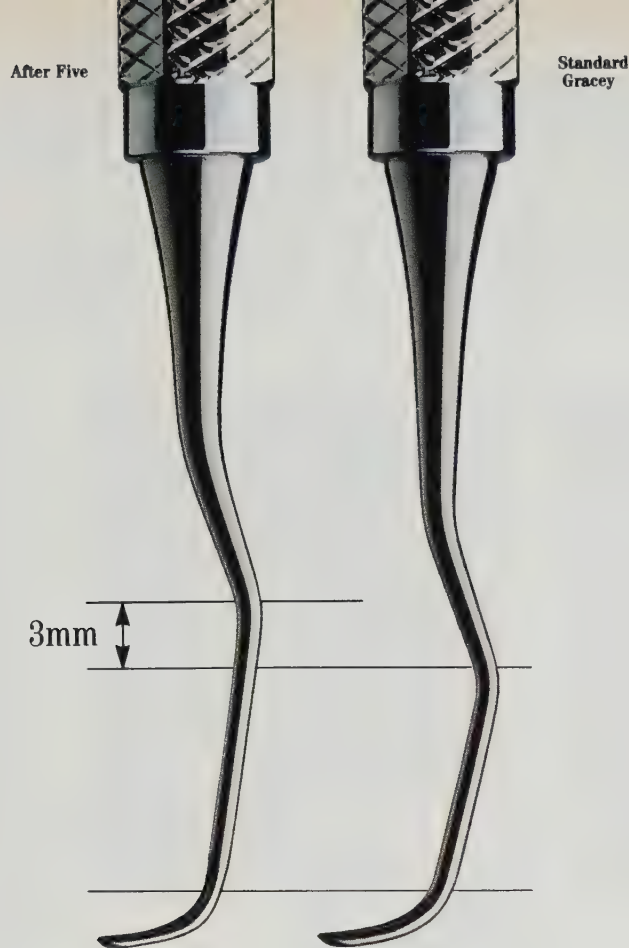
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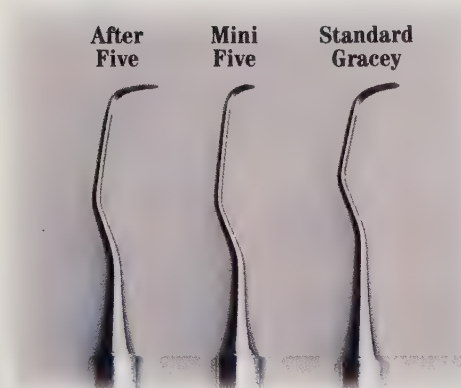
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Letters/Courrier



■ Keep McGill Open

I have just finished reading the September issue (Vol. 57 No. 9) and was pleased to see that support has been expressed for keeping McGill's dental school open.

A small correction is needed in the title under the photo on page 681, however. The proper name of the building housing the medical and dental faculties at McGill is the "Strathcona Medical Building."

*William McJannet
Pointe Claire, Quebec.*

■ Allow me to congratulate you on your excellent editorial: "Is dentistry programmed to self-destruct." McGill needs all the friends it can find at this time. In particular, we need friends who can convey meaningful messages.

*Harry Rosen, DDS, MRCD (C)
Montreal, Quebec.*

■ In the September issue of the *Journal of the Canadian Dental Association* (Vol. 57 No. 9), the lead article in the News Update section is entitled "McGill Faculty of Dentistry to Close." The title is misleading. The issue at stake is a recommendation of closure, only. This is acknowledged in the final paragraph of the news item, where it states that: "Canada's dental community will be watching and waiting for further developments relevant to the proposed closure at McGill." The impression created by the title, that McGill's faculty of dentistry will definitely be closed, is incorrect.

*Ivan Stangel, DMD, FAMD
Associate Professor, Section of
Operative Dentistry
McGill University*

■ Thanks to Dr. Dubé

This letter is to express my appreciation for the leadership of Dr. Gilles

Dubé during his year as the president of the Canadian Dental Association.

For the most part, I have followed Dr. Dubé's presidency through his monthly "President's Column" in the *CDA Journal*. He has written on important and difficult subjects, always with consideration, and his remarks have been representative of Canadian dentistry as a whole.

As a past president of the College of Dental Surgeons of British Columbia and a former governor of the Canadian

Dental Association, I am well aware of the demands placed on Dr. Dubé during his term of office. His last column was entitled a "A Fond Farewell," and I am sure I reflect the feelings of many members of the association when I say that Dr. Dubé's presidency will be fondly remembered and set a great example to those who follow him.

*John G. Silver, BDS, LDS, FRCD(C)
Vancouver, B.C.*

TO ALL CANADIAN DENTISTS' INSURANCE PROGRAM (CDIP) PARTICIPANTS WITH LONG TERM DISABILITY AND/OR OFFICE OVERHEAD EXPENSE INSURANCE

**IMPORTANT
NOTICE!**

As you may already know, Prudential Group Assurance Company of England (Canada) will be the new insurer for the CDIP Life and Disability Insurance Plans effective January 1, 1992. If you become disabled prior to December 31, 1991, please advise CDSPI within 45 days of the onset of disability.

In the event of disability, total or partial, it is imperative that full documentation supporting your claim be filed with Metropolitan Life within 90 days of commencement of disability. Failure to do so will result in Metropolitan Life refusing to accept the claim.

If you need further information call CDSPI now.



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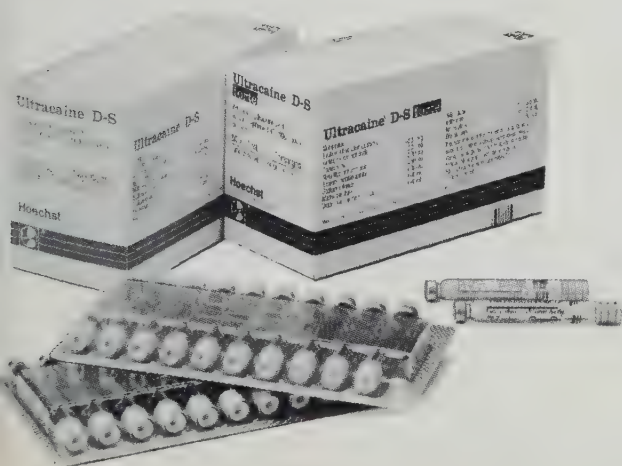
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Maybe this is because they feel that the choice of **Ultracaine** contributes not only to state-of-the-art clinical dentistry, but also contributes to good practice management. **Ultracaine** a valued anesthetic for everyday practice.



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See page 842 for brief disclosure.

Convention '91 - Report

CONVENTION '91 — Quebec City "Par Excellence"



The 1991 Convention Committee: (l-r) Dr. Gaston Bernier, Dr. Hélène Allard, Dr. Denis Robert, Dr. Vivian Carter, Dr. Michel Jahjah and Dr. Louise Beaudry.

Another great success story in CDA Conventions — 3,700 delegates, including 1,429 dentists, gathered in beautiful historic Quebec City for Convention '91. An exciting scientific program, 130 exhibitors at 202 booths plus the largest-ever children's program all contributed to a winning combination.

No Convention is a success without TEAM effort. To the spirited dentists of the Quebec City Convention Committee and to the CDA Convention Staff — how can we thank you enough for months of

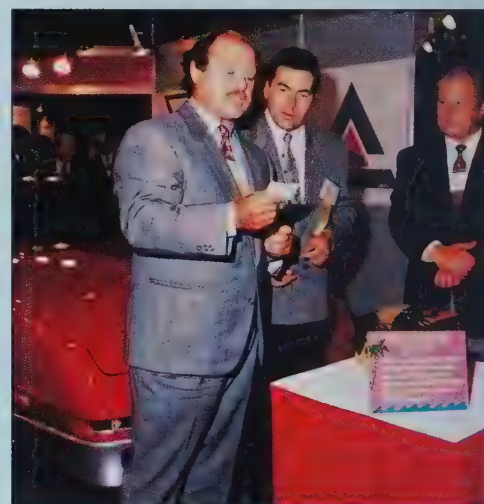
dedicated hard work. Thanks, also, to the Quebec local dentists who acted as chairpersons during the scientific sessions and to the dental students who assisted with on-site logistics.

Nor can a Convention spell success without the participation of exhibitors and commercial sponsors — our sincerest gratitude for your support.

BOOK NOW FOR CONVENTION '92
CALGARY, ALBERTA
AUGUST 29 - SEPTEMBER 2

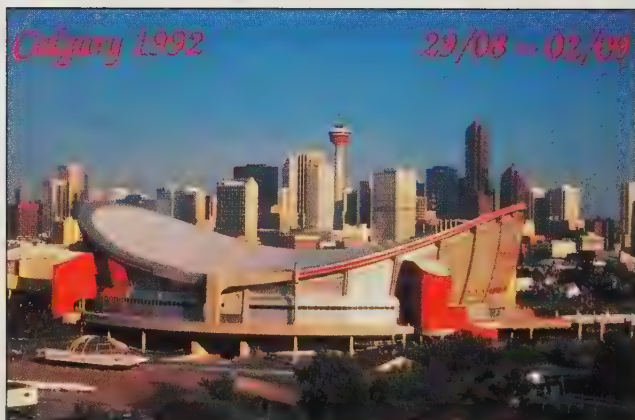


Dr. Gordon Christensen — New Aspects of Dentistry 1991



CDA President Dr. Les Allen announces the winner of the Daytona ES draw sponsored by Aurum Ceramic/Classic Dental Laboratories. Assisting are immediate Past President Dr. Gilles Dubé and Mr. Hans (Hyo) Maier, President of Aurum/Classic. The lucky winner was Dr. Nancy Jeffery of Fredericton, New Brunswick.

1992 Annual Convention in Calgary, Alberta



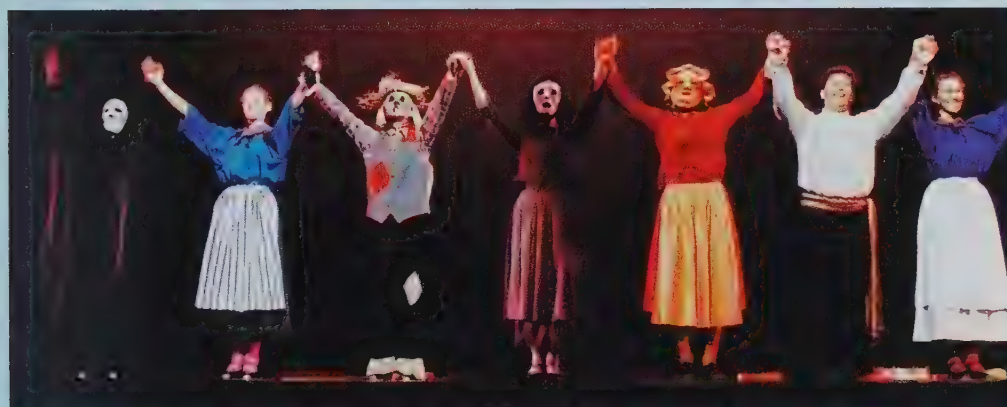
If you're not planning to be in Quebec City this August you're probably missing out on this year's convention. Don't let that get you down, CDA convention staff is planning ahead for next year so . . .

Grab hold of your cowboy hat, jump into your cowboy boots and stampede on down to the 1992 CDA Convention in Calgary, Alberta — August 29 to September 2.

Calgary is a city that offers beautiful scenery for nature lovers and rugged outdoor activities for adventurers. There is something for everyone. Plan to bring your family and staff to what promises to be another great experience.

Convention '91 - Report

Opening Ceremonies



Cirque du Tonnerre and Migration provide local talent and dance. The ceremonies were sponsored in whole by Healthco/Dépôt Dentaire

CDA's New President



Dr. Gilles Dubé officially installs Dr. Les Allen of Winnipeg as CDA President for 1991 — 1992.



1991 Table Clinics — always popular with convention delegates.

Dr. Gilles Dubé and Dr. Michel Jahjah officially open the 1991 Exhibit Hall — 130 dental companies at 202 booths.



Official Opening



Table clinics



Table clinics

Convention '91 - Report

Exhibitors



'Live Bob' and CDA staff member, Luc Pinard, had a smile for everyone visiting the CDA booth.



Exhibits have something for every member of the dental team.

CDA Convention Delegates Are Winners — Some in more ways than one...

Winner of the "weekend for two" provided by the Hotel des Gouverneurs was Dr. Daniela Ramsden of Ottawa, Ontario, while Dr. Thomas Chiu of Edmonton, Alberta, was the winner for the "weekend for two" provided by the Quebec Hilton. Ms. Jeanine Johnson of Toronto, Ontario, was the winner of the trip for two to Guadeloupe sponsored by Club Med. Winner of the pre-registration draw sponsored by the convention's official carrier, Air Canada, was Dr. Jean-Pierre Lacroix of Dalhousie, New Brunswick.

TV Draw



"And the winners are!" Dr. Gilles Dubé and Mr. Michael Hart, president of Ash Temple Ltd., announce the winners of two big-screen televisions — compliments of Ash Temple/Servident. The lucky winners were, Dr. Paul Jean, Ste. Foy, Quebec, and Dr. Douglas Arnold, Woodstock, New Brunswick.

Fun Run



More than 50 eager athletes participated in the Annual Fun Run on the historic Plains of Abraham.

DISCOVER THE NEW WORLD OF DENTISTRY



Practicing in the 1990s isn't necessarily smooth sailing. The practice you knew a few years ago has changed and will continue to evolve with government regulatory enactments such as OSHA and waste disposal, along with changing demographics and health care delivery systems.

To keep you abreast of these issues the 127th Chicago Dental Society Midwinter Meeting offers top clinicians and scientific programs to help you plot your course for the '90s.

Unique live-closed circuit television clinical programs

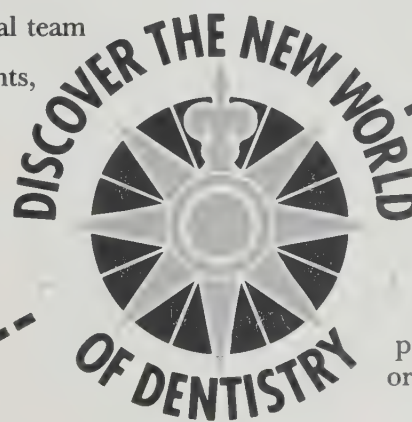
Technical exhibits and table clinics

Hands-on participation courses

Scientific programs for the entire dental team

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young dentists, auxiliaries
and spouses

*Plan now to attend the
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CDS Members (regular and associate) will automatically receive Midwinter Meeting registration materials.

The DAP Advisor

The DAP Advisor offers information, ideas and advice to improve dentist/patient communication, raise awareness about good dental health, and help your practice become busier.*

You control the supply of reading material in your office. To that extent, you can determine what your patients read during their time there. Since it is in your best interest to have them spend that time reading good dental literature, you might want to make it the only material available.

The walls have mouths

Communicating the prevention message is more than a matter of conversing with your patient. Although conversation, of course, is critical to a patient's understanding and appreciation of good dental health, the message is most effective when it is reinforced in other ways. Your own office, for example, is potentially a powerful communications vehicle.

From a communications standpoint, there are two reasons why your office is so crucial. First, it is a self-contained environment in which you control the ebb and flow of information. Second, during every working day it is inhabited by something most communicators crave – a captive and receptive audience.

Think of the typical sequence of events. Your patient sits in the waiting room, passing the time in some way or another until you are ready for his or her appointment. Then the patient sits in your examination room chair, looking at the wall or ceiling. To a large extent, you can make sure that his or her waiting-room time is not spent leafing through the latest Maclean's and that chair time is not spent staring blankly at a wall.

To see if your office is "communicating" well, take a few moments to complete this checklist.

Check "YES" or "NO" after the following statements:

My waiting room contains dental education reading material. YES ☐ NO ☐

These materials are accessible. YES ☐ NO ☐

They are on topics of interest to my patients. YES ☐ NO ☐

They are kept neatly and displayed attractively. YES ☐ NO ☐

I make use of wall space in my waiting room by hanging posters promoting dental health. YES ☐ NO ☐

I make use of inner-office wall space by posting dental health messages where patients are most likely to see them. YES ☐ NO ☐

Messages in reading materials and on walls reinforce each other. YES ☐

If you answered "yes" to at least six of these statements, good going. You are making good use of your office as a communications vehicle, and your patients have undoubtedly benefitted.

If you want to replenish your materials, or just spruce up your current stock, you can consult the CDA catalogue. It contains everything you need to keep your office "communicating."



The DAP Advisor is a service of CDA's Dental Awareness Program, an ongoing campaign dedicated to helping all Canadians keep their teeth Good For Life.

**Back by popular demand. This DAP Advisor was first published in the November 1989 CDA Journal.*

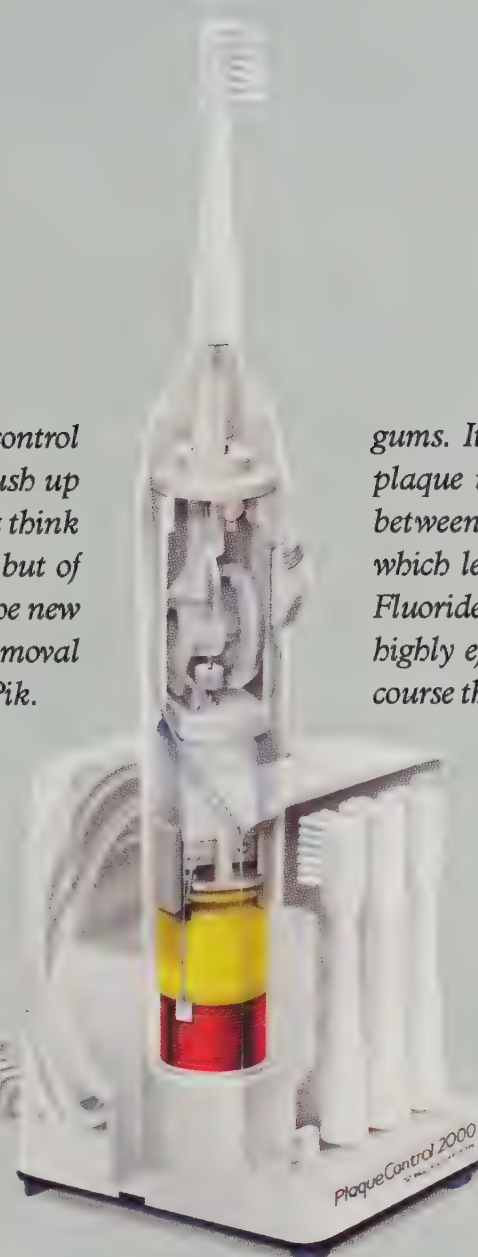
The most acclaimed brush strokes since Van Gogh.

Before you recommend a plaque control program, we suggest that you brush up on a couple of facts: 76% of adults think they won't develop gum disease¹, but of all adults, 75% will². They need the new PlaqueControl 2000™ plaque removal instrument from Teledyne Water Pik.

We like to say it has the most acclaimed brush strokes since Van Gogh because it's the only plaque removal instrument with the brushing motion that simulates the Bass technique, which is most recommended by dental professionals. With 2000 elliptical brush strokes per minute, the PlaqueControl 2000 cleans teeth thoroughly and stimulates

gums. It's clinically proven to remove the plaque that manual brushing can miss, between the teeth and at the gumline³, which leads to improved gingival health. Fluoride dentifrices have been shown to be highly effective in reducing cavities, so of course the PlaqueControl 2000 is designed to use any dentifrice, without extra maintenance. Best of all, the PlaqueControl 2000 is made by Teledyne Water Pik, a trusted name in professional dental products. So next time you're recommending a plaque control program, consider our new PlaqueControl 2000.

It's a work of art.



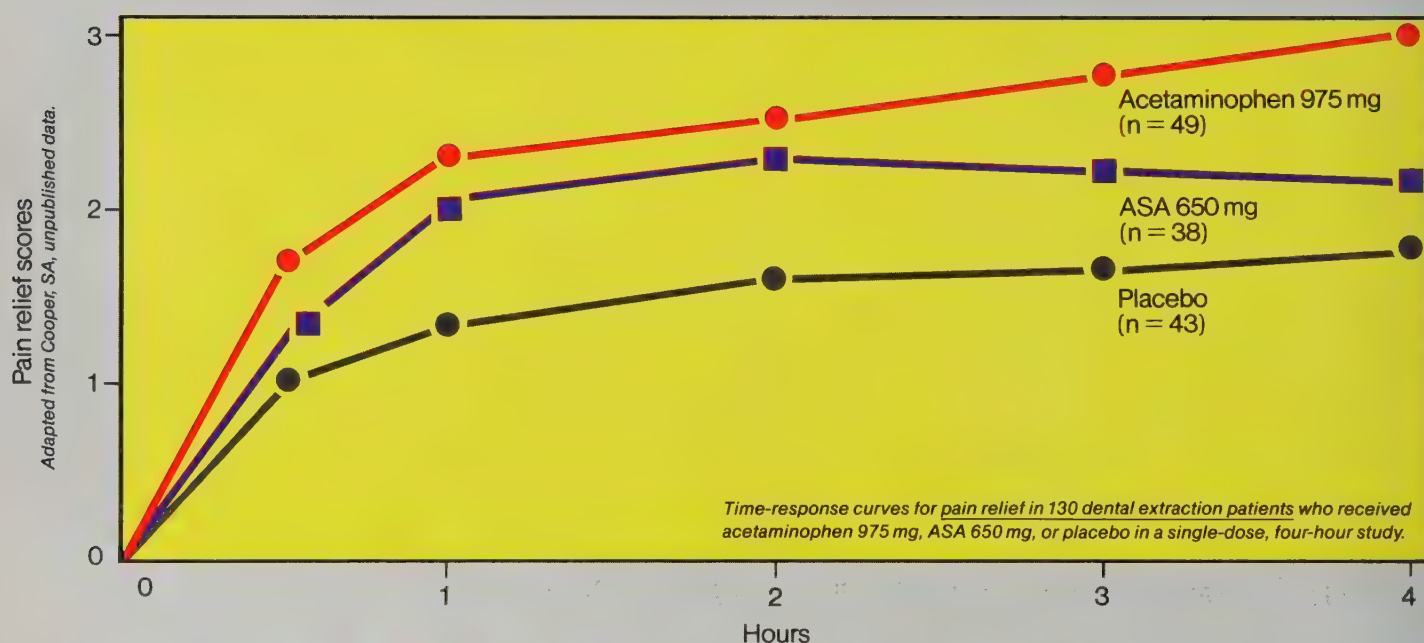
PlaqueControl 2000™
TELEDYNE WATER PIK

YOU HAVE TO THINK ABOUT MUCH MORE THAN PAIN RELIEF WHEN YOU RECOMMEND AN ANALGESIC

With some of the many analgesic choices available, you need to address a lot of medical questions to make a responsible professional recommendation.

Is the patient asthmatic or sensitive to salicylates, prone to ulcers, taking potentially incompatible drugs? A "yes" to any of these questions would exclude any ASA or ASA-narcotic combination product as well as all NSAIDs. And, of course, if there is a risk of bleeding, they would also all be contraindicated because their antiplatelet activity could aggravate bleeding.

Extra-Strength **TYLENOL** acetaminophen is a logical choice. It is not contraindicated in any of these situations.



EXTRA-STRENGTH **TYLENOL**^{*} acetaminophen **CAPLETS**

A responsible professional recommendation
combining excellent safety and efficacy profiles

Practice Management & Success

Incentives And Profit-Sharing Revisited

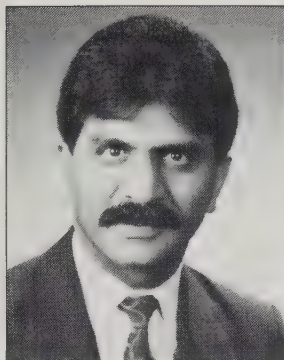
In the May 1991 issue of the *Journal* (Vol.57, No.5), I introduced the topic of profit sharing in the dental office. That column generated a number of requests for more information on ways and means of implementing these reward-for-achievement plans.

Taking Production Out of the Limelight

For many, myself included, the idea of rewarding performance, based strictly on production, causes discomfort. The last thing a dentist wants is to develop a reputation for being a salesman. And experience has clearly shown that developing an incentive plan based on production alone will send the wrong message to your team. One of my biggest challenges as a consultant has been to work out a profit-sharing plan that also focused on the other factors affecting the overall health of the practice, and not just production. The plan that I eventually developed is based on the premise that providing quality care is the overriding objective in the dental office. This clearly means providing only the required dental treatment – not overselling. It is imperative that the clinical integrity of the practice remains intact at all times.



The factors affecting the health of the practice – recalls, collections, new patient flow, over 90 day accounts, and open schedule time – are therefore integral to the success of a “quality-care” incentive plan. Basically, the idea is to emphasize these key factors before production. (Once these “key” factors are synchronized, production will take care of itself.)



Imtiaz Manji,
B.Sc
President of
ExperDent
Consultants Inc.

Examine **Table I** for a moment to get a grasp of how the plan works. The six factors that can affect the operation of the practice are identified in the left-hand column. (These are just examples. You may want to add some factors of your own.) Beside the factors column, there are three tier columns. These list an objective to be met and a weight for each factor, with the weights totalling six per cent in tier one, nine per cent in tier two and 11.5 per cent in tier three.

Tier one represents above average performance, tier two well above average, and tier three exceptional performance. Staff bonuses are calculated by taking the total weight points for the month and multiplying that figure by the gross regular salary of each team member. The bonuses paid will range from zero, if the team does not meet any of the objectives, to 11.5 per cent if all the objectives in tier three are met.

Hygienists, whose salaries are substantially higher than those of other team members, receive bonuses based on half of the total weight points achieved by the team. If the team has accumulated eight points, for example, a hygienist's bonus would be four per cent of her or his gross wage.

Isolating the factors

Recalls:

Every patient requires continuing care, but the frequency of recall appointments should be entirely patient dependent. Some patients need to be seen every three months, some every six months and some every two years. Based on your active patient base – patients attending the practice in the past 24 months – you can estimate how many total appointments are necessary.

If the objective of your practice is to always book appointments for the patient well in advance, then this factor should be monitored. The criterion for the first tier could be “80 per cent scheduled ahead,” for example (as is noted in the table).

Thus, if 80 per cent of all active patients were booked ahead, you would pay one per cent on this factor. If the practice met the recall success objective for tier two, by booking 85 per cent ahead, you would pay 1.5 per cent, and so on.

Ideally, your patients will make a commitment to their own oral health and keep their appointments. If your patients understand what you are doing for them and why, booking appointments for them ahead of time should be easy.

Collections:

Take a hard look at the success you've had in collections. If your objective is to collect 97 per cent of your January accounts payable by March 1, then you would allocate one point in tier one. In tier two, you may raise the objective to collecting 100 per cent of the January accounts payable by March 1, assigning 1.5 points to this category. In tier three, you may give two points for collecting 104 per cent of the January accounts by March 1. (It is possible to collect more than 100 per cent of receivables if there are long-term outstanding accounts.)

New patient flow:

If you have traditionally had 15 new patients per month, but you need 20, 25 or 30 in order to have a thriving practice, you should set your objectives accordingly – one point for 20 new patients, 1.5 for 25 and two for 30. Each new patient will require some sort of treatment and will therefore have a positive impact on production.

Production:

To de-emphasize pure production levels in your practice, you don't have to omit production from the scheme altogether. You make it part of the plan, but assign an equal number of points for it in each of the three tiers. For example, you may decide to pay one per cent on

TABLE I**Incentive / Profit Sharing Point System**

	Tier 1		Tier 2		Tier 3	
Recalls (active only)	1.0	80% Scheduled ahead	1.5	85% Scheduled ahead	2.0	90% Scheduled ahead
Collection	1.0	97% of previous 2 months (\$75,000)	1.5	100% of previous 2 months (\$75,000)	2.0	104% of previous 2 months (\$75,000)
New Patients	1.0	20	1.5	25	2.0	30
Production	1.0	\$45,000 per schedule (overall)	1.0	\$45,000	1.0	\$45,000
Over Ninety	1.0	less than \$5,000	1.5	\$4,000	2.0	\$3,000
Open Time	1.0	10 hours per month per practice	2	6 hours per month per practice	2.5	3 hours per month per practice
Total		6%		9%		11.5%

production levels once the team hits \$45,000 or more in total billings. This way, the team is encouraged to reach an above average level of performance, but not driven to become too production orientated.

Accounts Over 90 days:

Pursuing accounts that are over 90 days past due differs from making straight collections, because "over 90s" are notoriously difficult to collect. The practice's incentive plan should strive to keep the number and amounts of these accounts to an absolute minimum. You could (as I have done in the table) pay one point on having less than \$5,000 in unpaid accounts over 90 days, 1.5 points for less than \$4,000 and two points for less than \$3,000.

Open time:

Nothing is more costly to a practice than open time in the daily schedule. Once all your costs are paid, open time represents a large percentage of your bottom line. But with a full, active practice you should nearly always be able to fill open time. Give your team one point if they manage to keep open time to less than 10 hours per month, two points if they keep it to less than six hours and 2.4 points if they succeed in keeping it to less than three hours.

By emphasizing all of the factors described above – and not just production – you can improve your team's per-

formance in each area and reward your staff members for their for collective achievement. The added benefit of a rewards program is that it involves practice monitoring and, working together, ultimate improvement.



Establishing Some Rules

To achieve success, some rules must be followed. The incentive scheme should be reviewed every three months, changing the allotted points according to the relative strengths and weaknesses of the practice. For example, if your new patient flow is suffering, you may want to increase the points in this category and decrease points in another.

Staff members who are off work in any given month due to illness (beyond the established sick-day policy), or on vacation, do not qualify for the bonus in that month. For example, if the policy is to allow five sick days per year, then staff members do not forfeit their right

to the bonus until the month when they take their sixth sick day. And a staff member who takes a week's vacation in three separate months during the year is excluded from the bonus scheme for those three months.

Combining profit-sharing with performance and salary reviews

The beauty of this profit-sharing scheme extends well beyond its remarkable ability to motivate a team to achieve excellence. It is a valuable guideline when the time comes to conduct annual performance and salary reviews. In effect, the incentive plan sets the benchmark for success in the practice by establishing measurable job roles and responsibilities.

Performance and salary reviews should be done separately, with performance reviews in the different areas of the practice fuelling decisions for salary reviews. Using profit-sharing as a monitor, you will have something on which to base your discussions.

Giving raises

This is one of the most difficult issues in a practice. Confusion is the usual derivative, because staff often don't understand the method used to determine salary increases, while the doctor hates the whole process and all the inherent stress that goes with it –

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But salary reviews don't have to be difficult. You can base staff raises on the average points your team achieved in the profit-sharing scheme over the course of the year. For example, if the team achieves 10 per cent as their average base incentive-plan weight for the year, consider this as the minimum base line for raises during the following fiscal year. Any specific team member who displays exceptional merit and performance can be given a larger increase.

Making profit-sharing work

The benefits of a well-executed reward-for-achievement program are alluring, but the drawbacks to a failed program are catastrophic. You hold the control button for making profit sharing work for you rather than against you.

When you create the point system for each level of performance, it is vitally important that you know and understand the past performance levels in order to create realistic targets for the pre-

sent and future. There is nothing more demoralizing for staff than trying to meet objectives that are not practical.

Make sure that the purpose of the profit-sharing plan is understood by the entire team. It is not designed to motivate staff to perform their jobs to reasonable standards, but a well-deserved reward for exceeding your expectations. Once the scheme is understood, properly implemented and regularly monitored, your team will gladly rise to the occasion of heightened performance.



CDA Retirement Savings Plan

Unit values: (Funds are valued weekly)

Fund	Unit values as at	
	September 30, 1991	August 31, 1991
Bond & Mortgage Fund	87.32448	84.95952
Common Stock Fund	17.03636	17.35289
Money Market Fund	57.70672	57.33932
Balanced Fund	33.26178	33.18414

G.I.C. Fund Term	*Interest rates as at	
	September 30, 1991	August 31, 1991
1yr	8.60%	8.85%
2yr	9.10%	9.15%
3yr	9.35%	9.35%
4yr	9.60%	9.60%
5yr	10.10%	10.10%

(*rates subject to change without notice.)

Total Assets (Market value) of the Plan as of

	September 30, 1991	August 31, 1991
	\$145,345,017.90	\$145,105,688.90

For further information:

Write

or phone, toll free:



CDSPI

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Ultracaine (articaine HCl) has been shown to block conduction by interfering with the process fundamental to the generation of the nerve action potential, namely the large transient increase in the permeability of the membrane to sodium ions that is produced by a slight depolarization of the membrane.

Indications

Ultracaine is indicated for infiltration anesthesia and nerve block anesthesia in clinical dentistry.

Contraindications

Ultracaine is contraindicated in patients with a known hypersensitivity to local anesthetics of the amide group; in the presence of sepsis near the proposed injection site; in patients with severe shock; in patients with any degree of heart block; in patients with existing neurologic disease and in patients with severe hypertension.

When **Ultracaine** with epinephrine is used, the caution required of any vasopressor drug is in order.

Warnings

Methemoglobinemia

As with other local anesthetics, **Ultracaine** is capable of producing methemoglobinemia: this has been observed when an intravenous regional anesthesia technique is used. **Ultracaine**, when used as directed in dental procedures, was not associated with methemoglobinemia.

Usage in Pregnancy

Animal studies have not demonstrated teratogenic or embryotoxic effects of **Ultracaine**. However, safe use in pregnant women has not been established. **Ultracaine** is unlikely to be transferred to the mother's milk since it is rapidly decomposed and eliminated.

Precautions

Resuscitative equipment and drugs should be readily available when any local anesthetic is used. The safety and effectiveness of local anesthetics depend upon proper dosage, correct technique, adequate precautions and readiness for emergencies. **Ultracaine** should be used cautiously in persons with known drug allergies or sensitivities, or suspected sensitivity to the amide-type local anesthetics.

Patients with Special Diseases and Conditions

The p-hydroxybenzoic acid methyl ester contained in **Ultracaine**, as a preservative, has a hydroxy group in the para-position. This fact should be borne in mind in the case of patients with para-group allergy.

Adverse Reactions

Reactions to **Ultracaine** are characteristic of those associated with amide-type local anesthetics.

A major cause of adverse reactions to this group of drugs is excessive plasma levels, which may be due to overdosage, inadvertent intravascular injection, or slow metabolic degradation. Other causes of reactions to these local anesthetics may be hypersensitivity, idiosyncrasy, or diminished tolerance.

Dosage and Administration

As with all local anesthetics, the dosage varies and depends upon the area to be anesthetized, the vascularity of the tissues, the number of neuronal segments to be blocked, individual tolerance and the technique of anesthesia. The lowest dosage, needed to provide effective anesthesia should be administered.

	Infil- tration	Nerve Block	Oral Surgery
Ultracaine DS forte	0.5-2.5 mL	0.5-3.4 mL	1.0-5.1 mL
Ultracaine DS	0.5-2.5 mL	0.5-3.4 mL	1.0-5.1 mL

It is recommended not to exceed 7 mg/kg body weight in adults.

To date, **Ultracaine** has not been administered to children under 4 years of age, nor in doses greater than 5 mg/kg in children between the ages of 4 and 12.

Supply

Ultracaine D-S: 4% with epinephrine (1/200,000) and **Ultracaine D-S forte:** 4% with epinephrine (1/100,000) are available in 1.7 mL cartridges, box of 50 cartridges.

Product Monograph available on request.

References:

1. Dudkiewicz A, Schwartz S, Laliberté R: Effectiveness of Mandibular Infiltration in Children Using the Local Anesthetic Ultracaine®. *Canadian Dental Association Journal* 1987; Vol 53 (No. 1):29-31.
2. Lemay H et al: Ultracaine in conventional operative dentistry. *Journal of the Canadian Dental Association* 1984; 50 (No. 9):703-708.

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Practice Management

Cosmetic Imaging: The New Wave of Co-Diagnosis

Ken Neuman, DMD

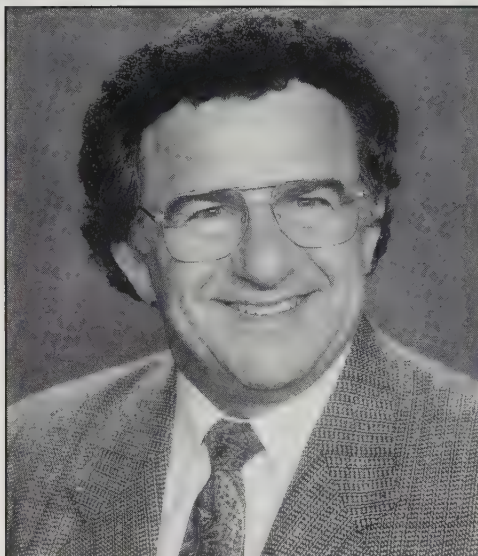
There is little doubt that if Dr. Robert Barkley were alive, he would have enthusiastically embraced the concept of cosmetic imaging. Using both extraoral and intraoral cameras would have been magic for the man well-regarded as the "father" of co-diagnosis.

Unfortunately, Dr. Barkley's untimely death in a plane accident blunted the visionary outlook of this dedicated communicator and pioneer. It is only now that we are beginning to appreciate the message he so ably gave us almost two decades ago.

Cosmetic imaging made its debut in dentistry around the mid '80s. I remember well my first vision of a cosmetic imaging system, at a continuing education course held at the University of Southern California. I (along with the other attendees) sat awe-struck at what we were watching on the monitors around the room: teeth were lengthened, diastemas were closed (Fig. 1), tooth color was modified (Fig. 2) and fractured teeth were restored to their original shape within seconds. But what left us visually overwhelmed just a few years ago has become routine in practices today, thanks to the use and development of cosmetic imaging systems.

As the components of all the imaging systems available today are very similar, we will discuss the extraoral and intraoral systems in the same vein. The components consist of a CPU (a central processing unit or hard drive), a color monitor, a keyboard, an extraoral camera and an intraoral camera (shaped like a dental handpiece), digitizing tablet (like an etch-a-sketch) and a device for creating a hard copy or photograph of the image captured by either camera.

The procedure is simple. The patient is seated in front of the camera, and a photo is taken of the inside or outside of the mouth. With the extraoral camera, there are three options: a full-screen photo, a side-by-side (the most common form of extraoral photograph) or a top-bottom position. When either of the latter two options are chosen, one side of the screen is used to show the original image, while the other side is used to change that image to what the dentist and patient want. We then can look at



Dr. Ken Neuman

both "before" and "after" images on the same screen.

Revolutionizing the Way We Communicate

Imaging can be credited with having drastically changed the way we communicate with patients. More specifically, it has altered the way patients hear and perceive what we want them to understand. The missing link to communicating effectively during the dental consultation, the visual impression, has been established. Thanks to imaging, dentist-patient discussions are being elevated to a new level.

We now have an unprecedented ability to involve our patients in the decision-making process. We simply take a photograph of a patient's smile, discuss the changes that he or she perceives as being valuable, add what our experience tells us would enhance the visual impact of the person's appearance, and produce a picture of both the "before" and the simulated "after" on the same photograph.

The days of asking patients to look into a hand mirror to try to focus on what we were seeing inside their mouths with our number-4 or number-5 sized mirrors are over. Now the dentist or assistant holds a small camera (no larger than a handpiece) in the patient's mouth

while, comfortably reclined, the patient views on a 14-inch monitor what the inside of his or her mouth looks like (Fig. 3). And the time required to train dentists and auxiliaries to use these systems is remarkably short. Most professionals can be "up to speed" with a mere one day's training.

One of the most impressive things I have found in using this technology – and watching others use it – is the change that occurs in the patient's perception of what is required treatment.

A young lady having her first experience with this technology was fascinated by what she saw on the screen during a tour of the first quadrant of her mouth. When asked to pick out the things in the second quadrant that she thought should be attended to, she did so with great accuracy.



Figure 1: Closing diastema



Figure 2: Modifying tooth color

But even more impressive were the comments she made to her dentist as he continued the photographic tour of her mouth. She said she came to him because she felt she was being pressured by her former dentist into having work

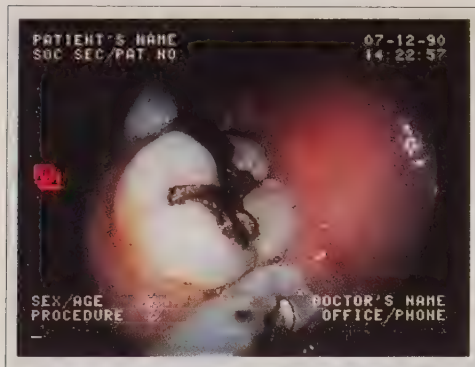


Figure 3: An intraoral image

done that she was not convinced was necessary. She had proceeded with caution with this new dentist. But upon seeing her mouth displayed on the screen, she said: "Now, for the first time, I can see that things really do need to be done. It's not that I did not trust what you were saying, but my trust has just jumped 100 per cent and I would like to have all the rest of the work done as quickly as we can."

These are not isolated comments. We hear them all the time: "I would probably not have had that work done for another five years if I had not seen what you could do"; or, "I never realized how much better I would look with that space closed," and so on.

There will also be the unsaid things, the thoughts that will go through your patients' minds as they witness your involvement with this new technology. They will take pleasure in knowing that you are at the "cutting edge" of the latest

advances in dentistry. You will command their respect by demonstrating that you are a professional ready and willing to adapt to ever-changing technology. Put simply, their confidence in you will soar.

Practices both young and old can be revitalized by this exciting new approach to communication. Hygienists can easily show patients areas of their mouth which, prior to this technology, were next to impossible to see. Patients can visualize for themselves what we tried unsuccessfully for years to show them with our mirrors.

Additional uses of these systems have been discovered, particularly in enhancing communication in the laboratory. I recently took some close-up photos of some inlays that needed to be modified prior to making them acceptable for cementation. I was able to focus on a small, specific area and produce a photograph that I could draw on to outline the very specific changes that were needed. I have also witnessed a surgical procedure where vision was impaired to a third molar area and the intraoral camera made it easy to see a root tip that had been almost invisible before.

The quality of the photographs being obtained through cosmetic imaging is improving dramatically over what it was when we started with this technology. We now have the ability to print names on photos, disclaimers if required, dates of treatment and almost anything else that would be of value to

an individual. As more people use these systems, and we become more creative, there will be no limit to what we can accomplish with visual communication.

Several devices are now being used to produce the hard copy for cosmetic imaging systems. A Polaroid freeze frame unit, a Hitachi image processor, and a Sony image recorder, all produce photos that can be easily carried by patients.

Cosmetic imaging is here to stay. Look at it carefully, and compare the various systems as you would evaluate any other device for use in your practice. Get some referral sources from each vendor and take the time to call them. You will not be sorry that you took the time, effort and cost to become involved with this most intriguing communication aid.

Several articles have recently evaluated Imaging systems - *Dentistry Today*, March 1991, and *Clinical Research Associates Newsletter*, March 1991. In addition, many large conventions are conducting workshops where you can see a variety of different systems, and witness how easily these can be incorporated into the general practice routine.

Dr. Ken Neuman graduated from the University of Manitoba in 1964. He maintains a private practice in Vancouver with an emphasis on cosmetic dentistry. He has lectured extensively in Canada and the U.S., and has written articles on cosmetic imaging in both countries. He has received fellowships in the Academy of General Dentistry, the Academy of Dentistry Internationale, and the International College of Dentists.



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Let's Talk

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If you are currently a non-participant in the CDA RSP, we'd like to send you a free information kit that will show you how an RSP enables you to save on today's taxes while you build financial independence in the future. This free kit contains the answers to 24 of the questions dental professionals most commonly ask about RSPs. It provides clear, concise answers to questions like: What type of RSP should I choose?; What is a spousal RSP?; What are my options when I retire?; and more. It also shows why dentists appreciate the benefits offered by the CDA Retirement Savings Plan. You, your spouse, your children and your employees are entitled to these special benefits:

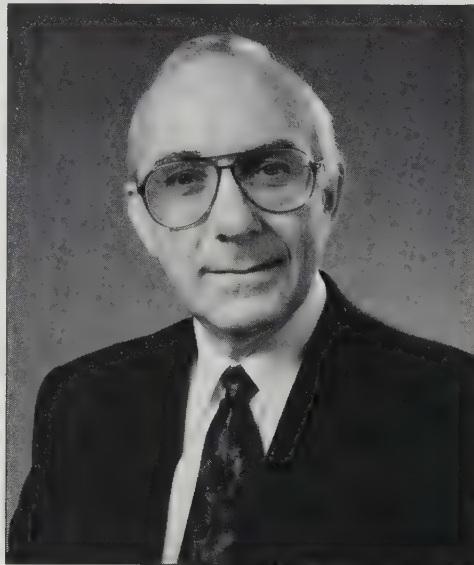
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Dr Mel Charendoff, DDS, MS, FRCD
President, CDSPI

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Let's Talk is an open letter to dentists from Dr. Mel Charendoff, the president of CDSPI.

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voice and a home.”*



Practice Management

Negotiating the Road to Financial Success

Thomas L. Snyder, DMD, MBA

It is an inescapable truth that you must manage your dental practice as a small business enterprise to be a successful practitioner.

And as the owner of a small business, you must face the constant challenges that come with managing and maintaining a profitable practice. Only then will you be able to direct your hard-earned dollars toward meeting your short-term and long-term personal financial goals.

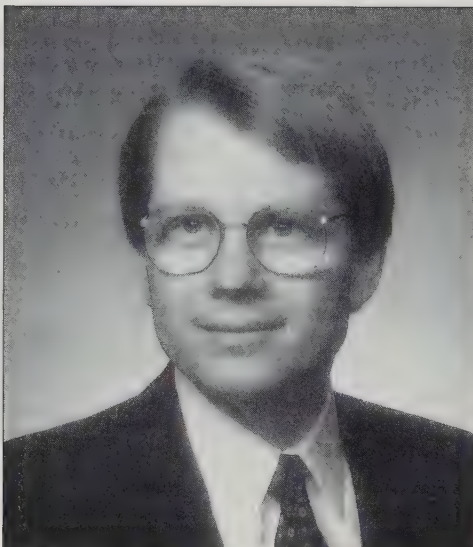
I have found that the most successful practitioners apply a goal-oriented approach to both their dental practice and their personal affairs. This goal orientation, combined with a sound financial and practice planning approach, almost always assures the attainment of both short-term and long-term financial objectives.

With constantly changing economic cycles, your personal and practice financial success will become even more dependent upon how well you manage and plan your practice. But although managing a dental practice is a tremendous challenge, we are in an enviable position compared to many of our patients, whose careers tend to be characterized by a less flexible earning potential.

Instead of being faced with a highly predictable pattern of income growth, you have the potential to quickly – and sometimes dramatically – alter your income. This freedom can be used not only to ensure a future lifestyle for you and your family, but it can often help you to relieve severe financial stress quicker than you could if your income was salary based.

The potential exists in every practice to improve profitability and increase income; the challenge lies in making a commitment to taking corrective action today rather than postponing it until tomorrow.

A properly designed practice and personal financial plan can give practitioners the vision and, yes, the motivation needed to enhance their position. No matter what stage of life you are in, a planning approach can be applicable and beneficial, although the complexity of the plan will change as your practice matures and you begin to accumulate assets.



Dr. Thomas L. Snyder

Two key objectives of personal financial planning are wealth accumulation and asset conservation, which are addressed by comprehensive planning in five major areas. As small business owners, you can apply several of these areas directly to your practice:

- 1) Make sure you have all the cash you need – through sound investment, tax planning, proper practice cash flow and personal cash flow management. This cash, of course, is needed for things such as education, funding and retirement.
- 2) Protect against risks – through life and disability, as well as property and casualty, insurance programs.
- 3) Maximize benefits for yourself and your staff – through properly designed, qualified and/or non-qualified pension plans, health plans and other fringe benefit programs.
- 4) Make sure the practice keeps going – through properly structured buy-sell agreements, cross purchase agreements, employment contracts, key person insurance, as well as mutual assistance pacts.
- 5) Protect those who will follow you – through the appropriate design of wills, trusts and gifting programs.

Taking Action

Knowing your objectives is obviously the first hurdle to jump, but it's only the first. Once you've pinpointed your financial and practice objectives, you have to take action – more specifically, planned action – to meet your goals. And this action should be ongoing, ideally from your first days of practice until your last.

Stage 1

Start-up or acquisition: Some of you are now in the process of completing your first year of dental practice. The key to your success is to be well organized, develop good management systems and have a good marketing plan. Having a practice "game plan" with written goals and monthly monitors is extremely important at this risky stage of your career. On the personal side, being able to adequately protect your family against loss of income through disability or in the event of death should be a major concern. For those who have children, developing a systematic funding program for their education (although small at first) is extremely important.

Stage 2

Growth and consolidation: Many of you have utilized management consultants and attended numerous management seminars. Your reasons for doing so were to increase your practice's patient volume and net income. On the other hand, some of you may have recently acquired another practice through a merger, thus allowing your own practice to grow quickly. Again, having a controlled management approach is critical. From a personal financial standpoint, one of your key goals is to eliminate debt, both personal and business debt, that you may have acquired as a result of a practice start-up or acquisition. Additionally, at this stage many dentists begin to formulate their long-term goals and often consider the implementation of some formalized retirement savings plan.

Stage 3

Practice plateau: Some practitioners in their late 40s reach a level of equilib-

rium in their practice, where growth is only illustrated through fee increases. This is particularly true in the case of specialists who have spent years building their referral networks. They now want to increase their personal time, sometimes at the expense of their referring doctors. During this stage, the emphasis is on practice profitability and continuing toward wealth accumulation on the personal side.

Stage 4

Transition: As practitioners reach their late 40s, many begin to think about what to do on the day they achieve true financial independence. Many dentists now target 55 as the age when they would like to be free, financially speaking, to decide whether to practise or not. This does not necessarily imply that these practitioners are interested in retiring from patient care activities, but only that they no longer want on-going management responsibilities and the stress of business ownership. Therefore, the thought of hiring an associate and/or a partner becomes a predominant part of their thinking. Now that their children may be entering and/or completing college, there is an even greater emphasis placed on retirement strategies and wealth accumulation.

Stage 5

Retirement: This is the most difficult stage for many practitioners to accept. Obviously, those individuals who have properly planned for the resulting economic change in their lives will enter retirement with less fear than those who, for many reasons, did not properly follow the planning approach. In any event, concerns about what to do after retirement, along with how one's lifestyle could be adversely affected by a lack of available resources, become the major issues.

No matter what stage they are at, most practitioners find that engaging in formal practice and/or personal planning – at some point in their career – is unavoidable.

Putting Your Practice Under a Microscope

Since 1991 has only one month remaining, it is an ideal time to take a "look back" at this year and begin to focus on 1992. To get started, take a few minutes to ask yourself the following questions:

1. Did I meet my personal income goals for 1991. If not, why not?

2. Did my practice overhead increase another two or three per cent? If so, why?

3. Was my practice growth at the level I had anticipated at the beginning of 1991. If not, what was the reason(s)?

4. Did I take the time this year to develop a practice plan and budget? If not, why not?

5. Did I utilize practice monitors to review my monthly performance?

If you had difficulty in answering most of these questions, the good news is that you're not alone. However, the bad news is that if you had spent time planning this past year – and monitoring your practice on a monthly basis – you probably would be well ahead of where you now stand financially.

The best way for you to increase your practice performance and personal income is to establish goals. These goals can then be translated into an over all practice plan.

The first step in developing a practice plan for 1992 is to develop a practice budget.

Step 1 – A Practice Budget

Establishing a practice budget is easier than you think. I recommend formatting your practice expenses into three major areas: fixed expenses, variable expenses and doctor's compensation. For example, take your 1991 practice statistics and organize them into the following categories: (Since we are almost through this year, do your calculations up to the end of October, pro rating to the end of 1991 by a factor of 16 per cent. Also, it may be easier for many of you to take one step back and organize your practice expenses from your 1990 data, which, of course, are complete.)

Fixed Expenses

1. Facility
 - rent
 - utilities
 - janitorial/security
2. Staff Compensation
 - staff gross salaries
 - payroll taxes
 - staff health insurance
 - staff pension contribution
 - other benefits
 - associate compensation
3. Office Professional Insurance
 - malpractice
 - office overhead (disability)
 - premises insurance
4. General Expenses
 - telephone
 - taxes/licenses
 - legal/accounting

- practice consultants
- leases
- debt service (principal interest)
- other

Total Fixed Expenses _____

Variable Expenses

1. laboratory fees
2. dental supplies
3. office supplies
4. staff continuing education
5. marketing (include yellow pages)
6. repairs/maintenance
7. other

Total Variable Expenses _____

Doctor's Compensation

1. draw/salary
2. payroll taxes
3. health insurance
4. continuing education
5. dues and subscriptions
6. pension
7. travel and entertainment
8. auto (if applicable)

Total Doctor Compensation _____

Step 2 – Protect Annual Practice Growth

After you have recorded all your 1991 expenses into these categories, estimate the annual growth you expect for 1992 by listing the percentages in each of the categories listed below:

	Annual Growth Factor
Total Practice Revenue	
(collections)	%
Fixed Expenses	
- facility	%
- staff compensation	%
- office professional insurance	%
- general expenses	%
Variable Expenses	%
Doctor Compensation	%

Step 3 – Determining the Practice Break Even Point

After you have calculated your planned revenue and expenses for 1992, you need to know what revenue should be collected weekly and monthly in order to meet these goals. This is called the break even point (BEP).

When this goal is reached, you'll know that all the expenses you have planned for, as well as your compensation, including perks, will be paid for. More importantly, your staff will now have a stated objective which must be met, and you have an important monitor to help you make sure that your practice is on track.

The formula to determine the break even point is:

$$\text{BEP} = \frac{(\text{Total Fixed Costs} + \text{Doctor Compensation})}{1 - \text{Variable Expense Factor}}$$

To calculate your variable expense factor (VEF), use the following formula:

$$\text{VEF} = \frac{\text{Total Variable Expense}}{\text{Total Revenue Collected}}$$

In order to illustrate how these formulas can apply to your practice, the following example is provided:

1990 Collections = \$381,000

1990 Total Fixed Expenses = \$179,430

1990 Total Variable Expenses = \$75,200

1990 Doctor Compensation = \$126,355

Step 1:

Calculate VEF:

$$\text{VEF} = \frac{\$75,200}{\$381,000} = .197$$

$$(\text{or } 19.7 \text{ per cent})$$

Step 2:

Annual BEP =

$$\frac{\$179,430 + \$126,355}{1 - .197}$$

$$= \$305,785$$

$$.803$$

$$= \$380,803$$

$$\text{Monthly BEP} = \frac{\$380,803}{12} = \$31,734$$

Your monthly BEP, then, would be \$31,734. Therefore, if this goal is met, your payroll, vendors, taxes, fringe benefits and compensation are paid for.

I recommend that you review your practice budget again in May 1992 to determine if the goals set earlier in the year are realistic. At least with a monthly break even point review, you'll know whether you are on target. If not, the time to take action is when the problem occurs, not when you calculate your year-end numbers for your income tax return.

Thomas L. Snyder, DMD, MBA, is president of the Healthcare Financial Network, an affiliate of The America Group Ltd., a provider of financial planning, pension, insurance and business advisory services to healthcare practitioners and closely held businesses. Headquartered in Radnor, Pennsylvania, The America Group has regional offices in Cherry Hill, New Jersey, and Stroudsburg, Pennsylvania.

CFDE Grant Applications Due

The deadline to apply for a CFDE dental education, research or service project grant is December 31, 1991.

Each year, CFDE supports a variety of individual education, research and service projects to promote and improve the quality of dental education, and to help increase public awareness of dental care. Preference is given to projects affiliated with dental schools and dental auxiliary programs.

Applications should be submitted in letter form, and must contain a full description of the proposed project, including a budget and funding sources.

For further information, please contact:



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CONTRAINDICATION:

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In contrast to salicylates, gastrointestinal irritation rarely occurs with acetaminophen. If a rare hypersensitivity reaction occurs, discontinue the drug. Hypersensitivity is manifested by rash or urticaria. Regular use of acetaminophen has shown to produce a slight increase in prothrombin time in patients receiving oral anticoagulants, but the clinical significance of this effect is not clear.

PRECAUTIONS AND TREATMENT OF OVERDOSE:

Resuscitation and supportive care must proceed as for any other potentially serious overdose. In acute overdose, serum levels of acetaminophen are meaningful in predicting those patients likely to develop serious hepatic toxicity. They must be drawn between 4 and 24 hours post overdose and the values plotted on the Matthew-Rumack Nomogram. N-acetylcysteine (N.A.C.) is a highly effective antidote for acetaminophen poisoning. Do not delay administration of N.A.C. either by parental or oral routes if the ingested dose is likely to be toxic (> 150 mg/kg ingested) or if serum levels are in the toxic range on the Nomogram. N.A.C. must be administered prior to the 24th hour post overdose to be protective. Further details on therapy of acetaminophen overdose are available by calling your regional Poison Control Centre.

DOSAGE:

Adults: 650 to 1000 mg every 4 to 6 hours, not to exceed 4000 mg in 24 hours.

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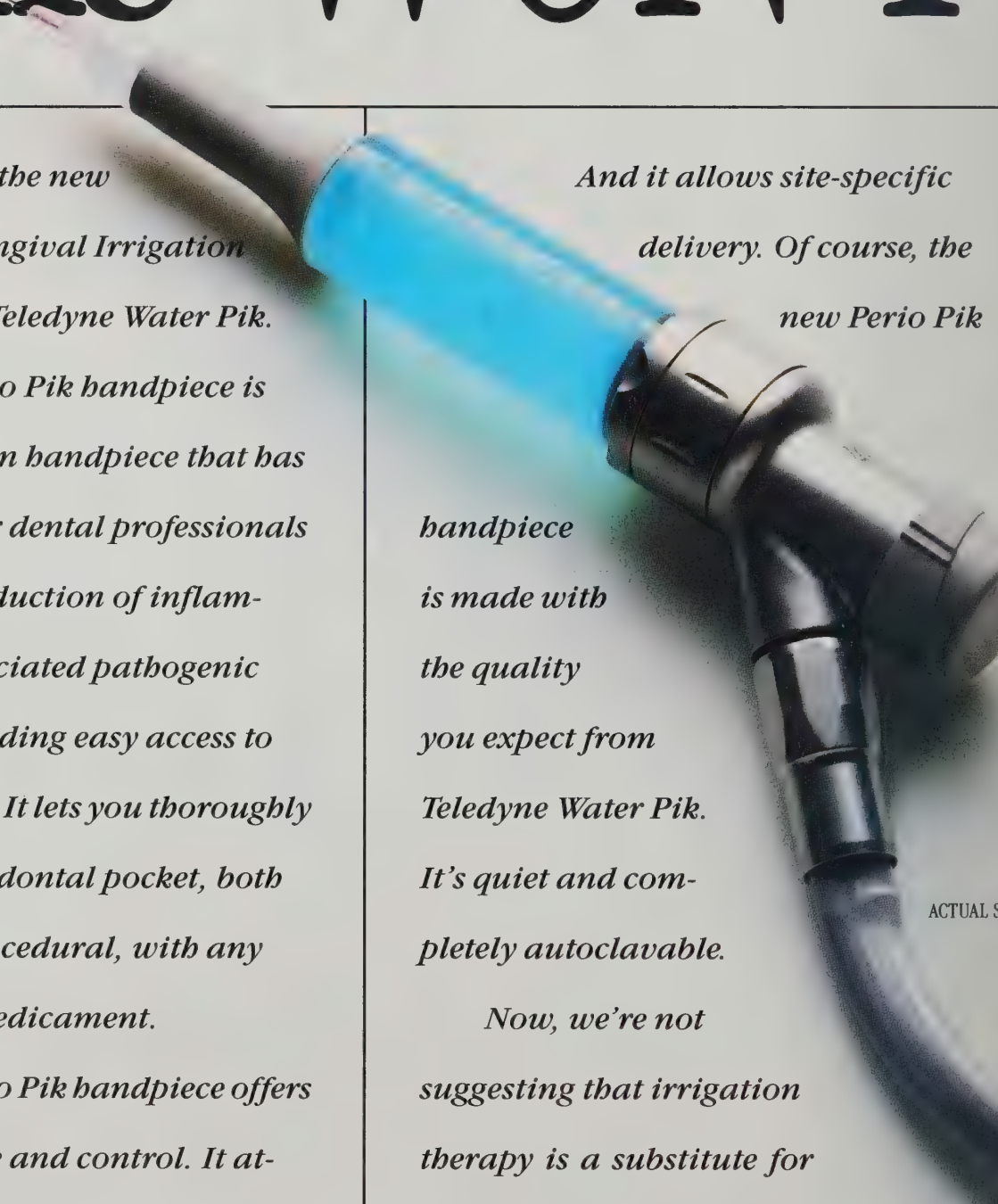
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Practice Management

Dr. Gordon Christensen At the CDA Convention

Dr. Gordon Christensen, the founder and senior consultant of Clinical Research Associates (CRA), presented a full-day lecture August 24, 1991, during the CDA Convention in Quebec City. Excerpts of his comments on two of the most discussed topics in dentistry today – composite and amalgam filling materials – appear below.

CRA employs over 300 clinicians around the world to test hundreds of different dental products and devices. There are also 30 full-time associates at the company's main facility in Provo, Utah. Dr. Christensen's personal chair time, combined with the results achieved by CRA's clinicians and researchers, has enabled him to speak convincingly on a variety of dental issues. Nevertheless, he considers his own five-operatory practice to be a full-time occupation – he practises two 12 hour days each week.

Dr. Christensen's comments were compiled and edited for publication by Dr. P. Ralph Crawford, the editor of the *CDA Journal*.

Dr. Christensen set the stage for his day-long lecture by asking the capacity audience to consider him as "a resource and not an authority."

"I don't think there is anyone who is an 'authority' in dentistry," he said. "Most of the useful information in dentistry comes from you and me – people in the field. Basic science researchers create a product and tell us it is OK. Two or three years later, we in the field will tell those researchers whether it is OK or not."

Amalgam

Silver amalgam is still here, said Dr. Christensen, and it is going to be around for a long time. However, population attitudes are shifting and shifting dramatically. Several months ago, CRA did a survey on silver amalgam use. It revealed that six per cent of dentists did not use silver amalgam at all because of its alleged mercury toxicity, but the majority of practitioners used silver amalgam at least some of the time. Only 17 per cent of dentists were not using composites at all.

Amalgam still works well in the very poorest of situations and, to a de-



Dr. Gordon Christensen

gree, is cariostatic, said Dr. Christensen. On average, amalgam will last about 14 years, and it has definite economic advantages.

In fact, says Dr. Christensen, "Silver amalgam is priced far too low. We virtually give it to the patient. The amalgam fee should be 100 per cent more than what we presently charge – considering the time involvement for a restoration of moderate complexity."

The fee guide of one provincial association lists the cost of a three-surface amalgam at \$47.80. If Dr. Christensen's "100 per cent more" proposal was applied, the amalgam fee for this type of restoration would rise to about \$100.

Dr. Christensen encouraged his audience to check their fee guides, with an eye to lowering some fees and raising others. "I'm a prosthodontist," he said, "And after 32 years (in practice) and doing 100 crowns a month, I can literally do a crown faster than I can do an amalgam of moderate complexity."

He went on to explain that if a crown sells for \$500 and it carries a laboratory fee of \$100, then the net revenue from a crown is \$400 – yet it takes the same length of time to do a crown as it does to do a silver amalgam.

"That's too high," he says, "My crown fees are low and my endo fees are low. But my restorative fees are high. I

think it is a better service to a patient to do a small restoration than to cut a tooth down to a crown."

Spherical and Blend Alloys

Dr. Christensen gave a brief update on silver amalgam types – spherical and blend alloys. A survey of 10,000 dentists showed that blends were the most popular. Three blends hold 58 per cent of the market – **Dispersalloy** leads with 33 per cent, **Titan** has 26 per cent and **Valiant Ph.D** nine per cent. Dentists should be aware that the biggest difference between the blends and sphericals is time. The blends set slower.

Dr. Christensen believes that dentists spend too much time standing around waiting for things to set. His philosophy is to use the fastest, easiest and best method to complete a task. If dentists could condense their tasks – without sacrificing either quantity or quality – they would have time to enjoy life without any loss of income.

The difference in setting time between blend and spherical alloys can add up, explained Dr. Christensen. If the average dentist does 10 alloys a day, and spends three minutes more per case using a blend as opposed to a spherical – $3 \times 10 \times 20$ (days) per month – he or she is losing a total of 10 hours a month. "This is a whole two extra weeks of saved vacation time in a year," said Dr. Christensen.

On the same topic of time, Dr. Christensen said that dentists in North America have been slow to switch to high-speed amalgam triturators. The older, slower models require about a minute more to complete their cycle than the new ones.

"Get yourself a fast triturator," he said. "Within two months, the time you've saved will have paid for your new high-speed model."

More Alloy Tips

Dr. Christensen had several suggestions for those concerned with mercury toxicity. **Indisperse**, for example, is a low-mercury alloy that shows considerable promise. It was developed by Dr. Bill Youdelis of the University of Windsor, who also invented **Dispersalloy**.

And Degussa Canada Limited's "RECAP" system offers a novel method for mercury disposal. Used alloy is placed in special containers, which are returned to Degussa on a regular basis. The company then recycles the used alloy, sells it, and donates the proceeds to charity.

Another way to control mercury release, said Dr. Christensen, is to store the scrap in used X-ray fixer. Combined with the fixer, the mercury vapor cannot be released into the atmosphere as long as it is kept in a plastic container with a plastic top.

Bondable Amalgam

"Bonding amalgam into teeth has become a fairly hot topic," said Dr. Christensen. "The Japanese have been using (the technique) since the early 1980s, and initially it looks very, very good."

One of the most beneficial areas for bondable amalgam use is where a tooth has lost more than a third of its isthmus from cusp tip to cusp tip. Bonding amalgam in these situations can bring the tooth back to its original, virgin strength. It is also an excellent material for amalgam cores, reports Dr. Christensen.

Restorative Resins:

Dr. Christensen said that there are two major, identifiable things that dentists do wrong with Class II resins – leaving open contacts and causing gross, unadulterated mutilation of the occlusal surfaces.

"Dentists leave open contact areas 50 per cent of the time," said Dr. Christensen. "This tells me that we don't know how to create contacts on resin restorations."

He said that open contact areas could be avoided by doing only one side at a time. "You can't do it like amalgam, where you "crunch" the material down."

In his own practice, Dr. Christensen uses a 25 micron band – 1000th of an inch thick – of dead soft surgical steel. He doesn't recommend using clear matrix bands, because they are 50 microns thick, and 50 microns is an open contact to a piece of floss, and he uses sycamore wooden wedges to tightly hold the matrix in place.

Mutilation of the occlusal surface usually occurs when a gross quantity of resin is placed into a restoration and then removed with a rough, coarse diamond. In cutting away the excess resin, the dentist may or may not find the juncture point and the tooth may be cut.

Dr. Christensen, therefore, uses a new 7408 Jet bur at each operation. He

maintains a very light touch and a double hand rest. The process is to shave, shave, shave, very lightly. The bur is not a waste – it is a standard bur that can be subsequently used for occlusal equilibration or for polishing amalgam.

Posterior Teeth

In over 23 years of *in vivo* resin research, one problem has persisted – occlusal wear. Clinical research projects show that the smaller the particle size is in the resin, the less wear-degeneration occurs during service.

Dr. Christensen named the four most popular resins currently in use in North America. "And what does it mean to be popular? It means it must work in the dentists' hands."

The most recent CRA survey shows **Herculite** (hybrid by Kerr) has 27 per cent of the market, **APH** (caulk Hybrid) 19 per cent, **P-50** (3M hybrid) 18 per cent, and **Heliomolar** (Vivadent micro-fill) 12 per cent, while all the other brands combined have less than 20 per cent.

Curing Lights

Dr. Christensen had a word or two to say about light curing. Many of the dentists attending his courses in Provo brought lights with them that were about half potency. A poor potency light will often contribute to cell injury and subsequent complaints of pain. He suggested several simple ways to check light potency.

"If you look at the lamp within the light and the filament is dark grey or black, then be assured that its intensity will be cut down by 70 per cent. A clouded reflector results in a 50 per cent decrease. A lamp should not be used for more than six to 12 months before being thrown away – even if it goes on. The wave length decreases and changes as the months go by.

"When buying a new light, look for ease of use and ease of changing the lamp. It needs a good fan that is not too noisy. A lamp should have a very potent direction and interchangeable tips. It should take small, curved or straight tips."

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Practice Management

The Future is Now, Seven Steps for Making it Happen

Jennifer M. de St. Georges

In the past decade, dentists have been surrounded by fellow professionals, business and management advisors talking about "the lack of busyness." These advocates of gloom and doom felt the future of dentistry was uncertain. Dentists close to retirement were quoted as saying that they were advising their sons and daughters not to choose dentistry as a profession. Statistics were used to show that the new generation was growing up with few or no cavities. Authors and speakers pointed out that no other profession was working so hard to put itself out of business.

In reality, however, the 1990s are showing the future of dentistry to have huge potential. By addressing seven key areas, a dentist can look forward to growth and security.

1. Harnessing the Latest Advances in Technology: In the hands of a communicator, an intraoral camera becomes a crucial aid to raising a patient's dental IQ. It is an essential tool, showing the patient how a certain problem can be handled and the benefits to be enjoyed as a result. However, this piece of equipment, without a commitment on the part of the dentist to training and utilization, becomes an expensive toy that never pays for itself, and thus a poor return on investment.

Solution

Dentists can protect their financial investment in new technology by investing time and money in learning how to maximize the benefits of that equipment. Such training needs to be supported by training in effective patient communication skills. Research has shown that practices investing in this kind of training usually experience a 50 per cent to 70 per cent increase in patient acceptance of needed treatment, and that this occurs within a very short period of time.

2. The Dental Consumer: Not a week goes by where the dental consumer is not exposed, either through the media or in the dental office, to "the



Jennifer M. de St. Georges

latest in dentistry." Today's educated patients will judge a dentist on how effectively this knowledge is communicated during the initial examination and consultation.

Solution

Be aware of the sources of your patients' education in order to better understand and assist them in their quest for knowledge and answers. Such sources can be found in magazines and newspapers, television and radio.

3. Staff Recruitment: The biggest investment an employer makes in his or her business is in the successful hiring and retention of personnel. According to an American personnel publication, 74 per cent of all jobs in the business sector are filled by the last applicant interviewed. This statistic demonstrates the lack of depth shown by most employers in the hiring process. The average length of employment in the dental profession for staff is 14 months, but the cost to a dentist of a staff member leaving the practice is \$10,000 to \$12,000 (U.S.). This figure does not even begin to reflect the stress and frustration felt by both employer and other team members during the transition stages of hiring and training a new staff member. Further-

more, patients appreciate seeing familiar faces around them when they visit their dentist, and rank inability to relate to a dentist's staff as one of the top reasons for leaving a practice.

Solution

The practice needs to establish a successful method of personnel recruitment and retention to ensure that it maintains a productive and professional staff to support the dentist in this age of "high tech, high touch."

A. Newspaper Advertisement: Make your advertisement the first one an applicant responds to. This is achieved by creating an exciting advertisement, using no abbreviations. Divided into two paragraphs, the ad's first paragraph advises the reader of the experience and talents the dentist is looking for. The second paragraph states the benefits and other advantages of working in this particular practice.

B. Personnel Manual: The key foundation stone for building staff morale, reducing and/or eliminating misunderstandings, and ensuring that there is no lack of information available to the staff is the personnel manual. Practices incorporating an up-to-date, well-written, easy to understand manual, enjoy the benefits on a daily basis. The manual is an integral part of the hiring process, so there are no surprises later.

C. Check References: Over 90 per cent of dentists fail to check the references of prospective employees with past employers. The value of this simple tool in establishing that a candidate has no hidden shortcomings, which are not always evident in an interview, cannot be overstated. A word of caution, however. If an employer and past employee parted company because of a misunderstanding, a reference may be based on some unfounded emotion. Taking the time to ascertain the facts will pay dividends for all concerned.

4. Orientation, Training and On-going Communication: Ken Blanchard, the author of *The One Minute Manager*,

wrote, "Hire the best, train or pray." Investing quality time in the orientation and training of a new employee is essential for the well-being and growth of the practice, the standard of care and service provided to the patients, and the return on investment in the most important resource a dentist has – his or her staff.

Untrained staff feel uncomfortable working with equipment, products and systems they are unfamiliar with, and will consciously or unconsciously sabotage the process until they are given good-quality orientation. A dentist asking why the computer is not being utilized for a certain procedure receives the classic answer, "Oh, that computer is useless. It takes so long to do (that specific task)." Interpretation: I don't know how the machine works. I don't have time to experiment with it as I am already running late and I don't see the benefit. The way I have done it in the past has been just fine. Or: "Oh, that (item, philosophy, thought) will never be accepted by the patient." Interpretation: I tried to use it in my old office, (without training, most probably) and was unsuccessful, so why bother trying again.

Solution

Set up well-thought out structures and develop the philosophies needed to orient and train all incoming employees. Such training also offers a fabulous way of revitalizing current staff on an ongoing basis.

A. Initial training: This should be handled during the first week of an employee joining a practice. Where possible, initial training should take place out of sight and not involve any patients. Training staff on or in front of patients, initially at least, is unprofessional and fraught with potential problems. Scheduling such training time has always been a management problem for dentists. However, the practices that have implemented training in this manner have seen dramatic, positive results.

B. Personnel Manual: Mentioned previously as a catalyst for full disclosure of key policies during the interviewing and hiring process, the personnel manual also becomes the practice's reference bible. Both employees and employer can refer to the manual on an ongoing basis for clarification of personnel and practice policy.

C. Opening the Lines of Communication: When an employer and employees are able to communicate, stress is reduced and small mistakes are taken care of before they become big mistakes. Practice morale is greatly increased, and the patients receive their dentistry in a

high-energy environment. Four key methods will aid a practice in achieving open communication:

1. the five-minute morning meeting
2. monthly practice meetings
3. regular evaluations (performance reviews)
4. a consistent structure to encourage open communication

5. Fiscal Responsibility: Today, the average overhead for a dental practice is 64 per cent, while in some metropolitan practices it reaches 75 per cent. Dentists can no longer afford to be casual about their approach to the financial aspects of managing and monitoring their practice. I believe all practices should be fully computerized, enabling dentists to forecast, control and react to potential problems almost on a daily basis. A dentist needs to include ongoing quality management time in his schedule for this task.

Solution:

An experienced dentist should be able to meet his financial goals in a 32 patient-hour week. To ensure practice financial goals are met, a daily planning period of 30 minutes, combined with four additional hours every week, is also needed.

A. Daily Management Time: Scheduling long mornings and shorter afternoons is the key to providing a foundation on which to build the ideal day. By scheduling 20 to 30 minutes of daily, quality protected time into the schedule, immediately after lunch, perhaps, the dentist is able to take control of the business side of dentistry. Additional weekly time needs to be included in the schedule as well.

B. Financial/Management Advisors: Working with business professionals, a dentist will find it easier to set and reach professional and personal goals. By eliminating surprises, stress is reduced and the quality of life is enhanced.

6. Effective Management Tools: The development and use of effective management tools are essential for a practice to adjust to the changing needs of both practice and patients.

Solution

Service is an all encompassing word. I personally feel that patients only question the fee when they question the quality of the service provided. When the patient is made to feel comfortable, service, as perceived by the patient, has been delivered.

7. Marketing: Marketing is an overused word. Let's replace it with Practice Growth and Development. There is a natural marriage between marketing and management. A practice that routinely runs on schedule has tapped into one of the all-time practice builders. However, if patients are made to feel uncomfortable by the manner in which they are handled, then the net effect will be a practice with patient retention concerns.

Solution

The 1990s' practice needs to identify key marketing strategies that both dentists and staff personally feel comfortable with. Marketing consultants tell us that a company should be spending five per cent of its budget on this area of the business. They also advise staying with a specific marketing approach for at least six months in order to see a return on investment. As a profession, dentists are becoming very open to experimenting with different approaches to increase new patient flow. When an immediate response is not identified, the agreed upon marketing approach is often dropped or changed, being deemed unsuccessful. A classic example would be patient newsletters. There is no immediate return on investment for this particular marketing approach. However, long-term benefits, though hard to track, can be substantial.

By establishing management policies that are consistently and fairly applied to all patients in a professional yet caring manner, the practice's internal marketing program becomes an integral part of the practice.

Summary:

These seven key areas form a foundation on which a practice can build a solid structure to prepare for the future. In today's world, it is necessary for a dentist, as an employer, to become a risk taker. As the old saying goes "nothing ventured, nothing gained." Sometimes even the wrong move or action can be more positive than no action at all. Because of training and natural inclination, a majority of dentists are perfectionists, which can result in risk taking being a stressful aspect of management, growth and change.

Jennifer M. de St. Georges is an internationally recognized practice management educator who has spoken at virtually every leading meeting in Canada, the U.S. and the United Kingdom. Her International Centre for Professional Development and Growth is located 45 miles south of San Francisco in Los Gatos, California.

Interview

Dentistry For the Future

Dr. Ron Jordan, one of the most sought after lecturers in the dental world, is an old hand at talking to the *Journal*. An interview with Dr. Jordan was published in the March 1989 (Vol.55 No.3) issue of the magazine, just before he assumed his duties as the dean of the faculty of dentistry at the University of Manitoba. At the time, he was returning to the Prairies after a distinguished 23-year career with the University of Western Ontario in London.

Dr. Jordan earned his dental degree from the faculty of dentistry at the University of Alberta in 1954, and a master of science in restorative dentistry from the University of Washington in 1962. His name has become synonymous with composite restorative materials and the ever-widening field of esthetic dentistry.

In preparation for a special issue on practice management, the *Journal* revisited Dr. Jordan to talk about how education and dental materials will affect the practise of dentistry in the future.

JOURNAL: *Dr. Jordan, the last time you were interviewed by the Journal was in 1989, just prior to your appointment as dean of the faculty of dentistry at the University of Manitoba. What have the last two years been like?*

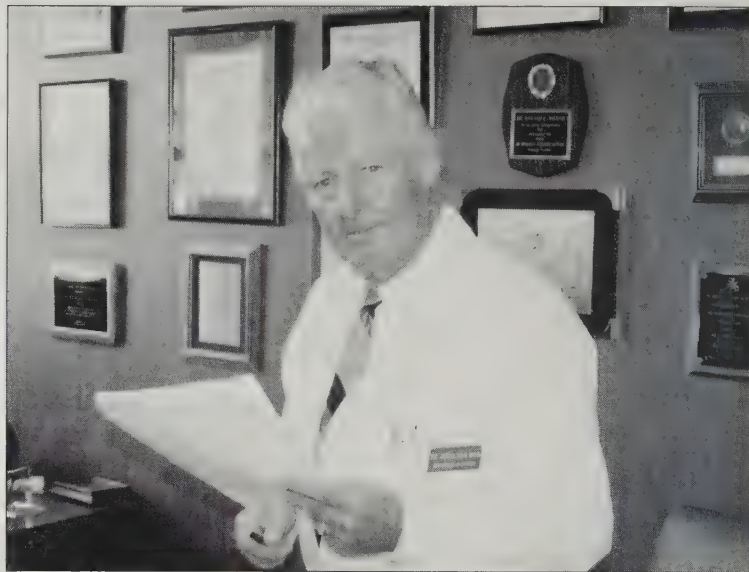
DR. JORDAN: They have been superb years. I had a minor slow down about a year ago with a coronary bypass, but it was over very quickly. Over the last two years, we have completed the construction of a wonderful clinical facility at our dental faculty. This involved a 10,000 square-foot addition to the dental building as well as a complete renovation of the entire clinical area. We now have 65 large bays, all highly conducive to four-handed dentistry. Our new clinical facility is a real breath of fresh air.

In addition to the physical plant, we have had some very promising developments in terms of faculty appointments. As of April 1, we had attracted two new academic faculty to our oral biology department – Dr. Raj Bhuller, a biochemist from McMaster University, and Dr. Song Lee, a molecular biologist. We are currently planning two new appointments to our orthodontic department in anticipation of expanding the orthodontic program.

We have also been very fortunate in attracting Dr. Mike Suzuki from the University of Western Ontario. He assumes the headship of the department of rehabilitative dental sciences. In addition, our faculty plans to reestablish a periodontal graduate program in September 1992.

JOURNAL: *Dr. Jordan, where is the money coming from? These are times of recession and fiscal restraint, and we have heard a lot of talk about other Canadian dental faculties being in trouble. Within the last year alone, the dental faculties in both Alberta and Saskatchewan were under severe review, and there were rumblings that they would close. At this very moment, McGill University is considering a proposal to close its dental faculty in 1995. Manitoba must have the only dental school in Canada with a new physical plant and staff additions.*

DR. JORDAN: We, too, have experienced significant budgetary cutbacks, but in spite of this, due to very intensive



*Dr. Ron Jordan, dean of the faculty of dentistry,
University of Manitoba*

budgetary planning and management, we have been able to fund these appointments.

JOURNAL: *Let's talk a bit about the supply of dental hygienists in Canada. We constantly hear that there is a shortage. Is Manitoba planning to expand its dental hygiene program?*

DR. JORDAN: I am highly sympathetic to the acute shortage of dental hygienists, not only in Manitoba but across Canada and the entire North American continent. I have forwarded a strong recommendation to the office of the university president proposing that the faculty expand the undergraduate diploma program by 50 per cent. The senate has approved of the proposal in principle, but they did not approve the funding needed to implement it. Plans for expansion are therefore somewhat in limbo.

The overall picture of dental hygiene in Canada is brightened, however, by increased enrolment levels in other parts of the country. It is my understanding that both Dalhousie and Alberta are planning for increases in their diploma programs.

The University of British Columbia has initiated a new, time-flexible degree-completion program in dental hygiene, which is designed to train future academic leaders, as well as people in the field in careers that require advanced clinical skills. Here in Manitoba, we have a hygiene baccalaureate proposal before the senate but, again, funding stands in our way. I am convinced that we need these degree programs in hygiene, because we are facing an acute shortage of teachers in hygiene.

The number of Canadians taking hygiene programs in the United States is also increasing, and I believe there were around 100 people from the U.S. who applied to take the Ontario hygiene examinations this year.

JOURNAL: *The University of Manitoba has a class size of 25 students entering dentistry. Was there any difficulty filling the class with qualified applicants?*

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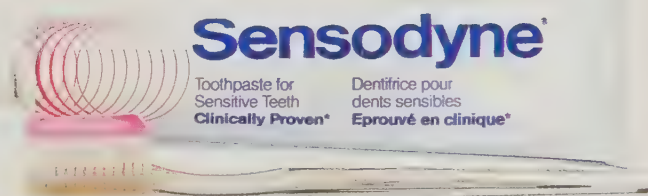
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DR. JORDAN: Not at all. For the 1991-92 year, we had 184 qualified applicants for the 25 spaces. This gave a ratio of about 8:1, which enabled us to pick the cream of the crop. It's a very positive indicator that our young men and women are very definitely pursuing careers in dentistry. Applicant pools are rising rather than decreasing.

JOURNAL: *With changing demographics, technology and materials, are there any specific revisions to the dental curriculum?*

"Young men and women are very definitely pursuing careers in dentistry — applicant pools are rising rather than decreasing"



DR. JORDAN: Changes are certainly under way. Right now, we have a curriculum review committee in place that is doing a very intensive review of the curriculum. This preparatory work should lead to the establishment of a brand new curriculum — probably in the fall of 1993.

With the marked decrease in the prevalence of dental caries, it is clear that we have virtually eliminated the disease of dental caries in our young population. The future of "drill and fill" will probably be passé. We will, however, still encounter high caries rates in certain segments of the population, such as those living in remote northern areas.

I perceive that geriatric dentistry will undergo enormous expansion in the near future. Practitioners everywhere are seeing more geriatric patients than ever before. The aging baby-boomer population — those born between 1946 and 1953 — are rapidly approaching middle age and the geriatric status. Needless to say, geriatric dentistry will play an enormously important role in our new curriculum. The geriatric population has a very high incidence of periodontal disease and, accordingly, periodontology will by necessity undergo tremendous expansion.

Geriatric restorative dentistry will also experience remarkable growth, with emphasis on incisal erosion lesions, wear on the posterior teeth associated with loss of vertical dimension, root caries and cervical erosion/abrasion lesions.

All of these typical geriatric restorative problems can be conservatively solved using our new adhesive resin bonding techniques. Over the last five years, there have been major advances made in the development of these materials. We are currently testing some of them in Manitoba. I confidently predict that they will revolutionize restorative dentistry — particularly for the aging population.

I also predict great expansion in advanced restorative dentistry, involving implants and sophisticated fixed prosthodontics and advanced operative dentistry. All of these fields will no doubt be expanded significantly in our undergraduate teaching program over the foreseeable future. Esthetic dentistry will also undergo increased expansion, simply because our patients are more conscious of appearance. There is a very high need and a very high demand for esthetic dentistry procedures nowadays.

JOURNAL: *The next question, then, is fairly obvious. Do you see a good future for the upcoming graduates. There are concerns that dentists of the future will not find enough work to keep them busy.*

DR. JORDAN: I see a very, very bright future. I think that probably the best thing that ever happened to us in dentistry is the virtual elimination of dental caries in our young population. The old days of "drill and fill" dentistry are gone forever. With the development of adhesive bonding procedures and the advent of very conservative and sophisticated restorative techniques and periodontal treatment modalities, the practise of general dentistry in the future will be a very exciting one to say the least.

I commonly say, when I am giving my lectures, that: "Today is not the time to retire from dentistry. It is the most exciting time we have experienced over the last 100 years. I confidently predict that the next 10 to 15 years will be marked by even more sophisticated advances than the past 10 have been."

"Today is not the time to retire from dentistry. It is the most exciting time we have experienced over the last 100 years."



JOURNAL: *But Dr. Jordan, aren't sophisticated techniques one thing and having enough patients another?*

DR. JORDAN: As far as the manpower situation in general is concerned, I very commonly state that if the present day practitioner keeps up with his or her field, he or she will find no difficulty in remaining busy. I think it is very safe to say that if practitioners allow themselves to get behind in this ever-changing field, they will have much more than an ordinary amount of spare time. I feel very strongly that keeping up with the field and the advances in dentistry will keep dentists busy. I do know that the need and the demand is there, but this requires constant continuing education. I tell my young dental graduates today that if they don't take at least 30 to 40 to 50 hours of continuing education, they'll find themselves so far behind within two years that they won't know what they are practising. I feel very, very strongly that continuing education and keeping abreast of the rapid advances in dentistry are absolutely essential to the successful continuation of dental practice.

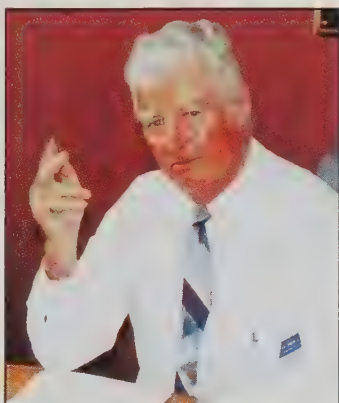
JOURNAL: *It has been 10 years since AIDS was first diagnosed in North America. What significance has this had on dental faculties?*

DR. JORDAN: The advent of AIDS — and let us not forget hepatitis B, which is probably more dangerous than AIDS — has had an enormous impact on dental faculties. It has brought about a new era of infection control and sterilization procedures. Cold sterilization is now history in our faculty, we work

entirely out of autoclaved kits. As is the case everywhere else, gloves, masks and safety glasses are now routine.

In Manitoba we treat, as a matter of routine, HIV positive patients. We are not allowed to ask a patient if they are HIV positive. All patients are treated with the same precautionary procedures.

"Continuing education and keeping abreast of the rapid advances are absolutely essential to the successful continuation of dental practice."



JOURNAL: What would you do if one of your students came to you and said he or she was HIV positive?

DR. JORDAN: We are prevented by human rights legislation from making any restriction whatsoever to the participation of that student, and the same rule applies to faculty. I would expect that student or faculty member, if they are HIV positive, to exercise the same degree of precaution that is exercised for any treatment procedure that is carried out in the university.

JOURNAL: Let us switch to another much-talked about subject. What is your prediction on the use of dental silver amalgam in the future?

DR. JORDAN: I confidently predict, as an educator, clinician and clinical researcher, that silver amalgam will undergo an expanded usage in the future.

Keep in mind that silver amalgam has been used successfully and safely in dentistry for over 150 years. It is the most forgiving restorative material we have at our disposal – silver amalgam will forgive more clinical sins than any other restorative material – it is dentistry's only self-sealing restorative material, and the silver amalgam procedure lends itself to the most simple, least complicated clinical technique.

The so-called substitutes for silver amalgam, such as posterior composites, heat-cured inlays, and porcelain inlays are infinitely more technique sensitive than silver amalgam, infinitely more difficult to place and substantially more expensive. In the absence of any clear-cut clinical evidence that silver amalgam is in fact linked with systemic disease or impairment, it will continue to have wide spread usage over the foreseeable future.

Let me give you another reason why I make that statement. Recently, some adhesives were put on the market that will actually bond silver amalgam to tooth structure – to enamel, dentin and cementum. (The bonding process is very similar to the manner in which we have been bonding resin composite materials to tooth structure.) Silver amalgam is now a bondable material and this alone will tremendously enhance the usefulness of amalgam as a reliable material.

Let us look at an example. How many practitioners encounter adult patients and aging patients who present with fractured cusps from pre-existing silver amalgams. Previously, the entire restoration had to be removed and new material built up with a pin-retained amalgam core. Now, with silver amal-

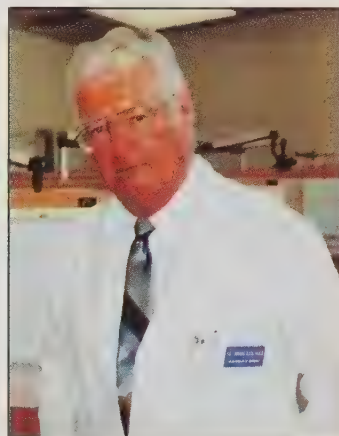
gam adhesive bonding systems, we can simply place the adhesive bond over the silver amalgam and the tooth structure, and condense new silver amalgam. The newly-placed amalgam bonds magnificently to both the old amalgams and pre-existent tooth structure.

So, silver amalgam, because it is now a bondable restorative material, will undergo wide-spread expanded usage in the future. We have found one basic and fundamental principle within the last 25 years of clinical research with adhesive bonding systems – adhesive bonding materials lend themselves to an extremely conservative approach in restorative dentistry. I confidently predict expanded use of amalgam because of this fact.

The future of amalgam is by no means gloomy – it is a very bright picture indeed. It will not only be with us for a long time to come but will also enjoy expansion. Keep in mind a very important principle – we have not yet developed a suitable substitute for amalgam restorative dentistry, and until we do it will unquestionably be around for a long time.

JOURNAL: Dr. Jordan, those are very strong words. You are the first person we have heard who is advocating the expanded use of amalgam. What many of us are hearing today is that in three to five years silver amalgam will be history.

"I confidently predict, as an educator, clinician, and clinical researcher, that silver amalgam will undergo an expanded usage in the future."



DR. JORDAN: I don't foresee that. I say that after nine years of very intensive clinical research with posterior composites it has been shown that they cannot be routinely used as replacements for silver amalgam. This does not mean to say that posterior composites are contraindicated, but they are only indicated under two circumstances – where esthetics is of primary importance, such as in the maxillary pre-molar region, or where the practitioner can cut a very conservative cavity preparation.

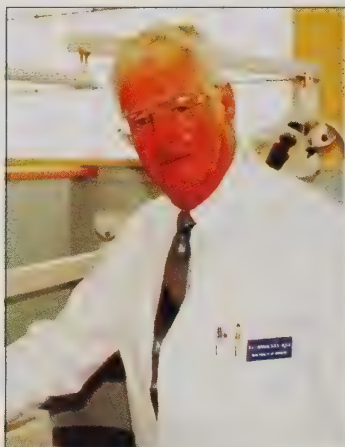
Posterior composites are not indicated in the molar region where the buccal-lingual width of the cavity preparation exceeds two thirds of the inter-apical distance. The material may show enough wear over a prolonged period so as to seriously compromise the integrity of the posterior occlusion. Just another reason for the continued favor of silver amalgam.

JOURNAL: What about dentin bonding materials?

DR. JORDAN: The development of dentin bonding materials is of enormous significance to the future of the general practice population profession. Simply, we have been monumentally successful in bonding to enamel. I can show you 20-year results that would knock your eye out. Until recently, we have not been that successful in reliably bonding to dentin. Dentin bonding is a much more complicated process.

However, here at the University of Manitoba, we are clinically testing, by means of clinical trials, a couple of newly-developed dentin bonding materials that bond to dentin even better than bonding to enamel. This is significant. The day we bond to dentin with equal reliability as we do to enamel, then restorative dentistry will undergo a virtual revolution. Text-books in operative dentistry will have to be rewritten because a brand new era of conservative restorative dentistry will be introduced.

"The development of dentin bonding materials is of enormous significance to the future of the general practice."



JOURNAL: What about glass ionomer cements?

DR. JORDAN: Again, I confidently predict that glass ionomer cements will enjoy expanded use over the next few years, particularly with the advent of light-cured glass ionomer.

Remember, glass ionomer cements have four major advantages. They bond to dentin, they have a high degree of

biological acceptability, they have a very effective slow fluoride release, and glass ionomer bonds micro-mechanically to resin composite materials. These factors will contribute to their increased use in the future.

I also confidently predict that the newly developed resin cements that have been introduced to the market within the past two years will increase in their role. Zinc phosphate cements and even polycarboxylates will be used less and less for the cementation of inlays, crowns and bridges. The resin cements are totally insoluble in mouth fluids, are at least four times stronger and also have the unique ability to bond micro-mechanically to enamel, dentin and cementum. Keep your eye on the resin cements.

JOURNAL: And fluoride containing materials?

DR. JORDAN: The fluoride containing materials will occupy an expanded role also. Their anti-cariogenic properties have been clearly documented. Our seven-year recalls are now coming in on porcelain veneers and we are finding the failure rate to be very, very low. These porcelain veneers have four major advantages; they are very esthetic, they have beautiful gingival tissue response, they are fracture resistant and they are placed very conservatively. Porcelain veneers are reliably indicated for conservative treatment of relatively intact but otherwise discolored, malformed or malaligned anterior teeth.

JOURNAL: Dr. Jordan, the Journal is very grateful for your views on dental education and particularly for your comments on restorative materials. It is always refreshing to share your enthusiasm for the future of our profession.

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Hepatitis & HIV: Prevalence of infection and changing attitudes toward infection control procedures in British Columbia

Diane L. Roscoe, MD, FRCP(C)

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Vancouver, B.C.

ABSTRACT:

Dental professionals attending the annual meeting of the College of Dental Surgeons of British Columbia in June 1990 were involved in a survey to assess the prevalence of infection with Hepatitis B, Hepatitis C and Human Immunodeficiency viruses, the acceptance of vaccination for protection against Hepatitis B virus, and the compliance with infection control guidelines. Participation was voluntary and anonymous and required completion of a questionnaire and donation of a blood sample. Four hundred one of 1,995 convention attendees participated. Fourteen were found to have markers of Hepatitis B infection; 13 had antibodies to both Hepatitis B surface antigen and Hepatitis B core antigen, and one was positive for Hepatitis B surface antigen. One individual had markers for both Hepatitis C and Hepatitis B viruses. None tested positive for antibody to Human Immunodeficiency virus. Vaccination against Hepatitis B virus was reported overall by 67 per cent of the participants, but Dentists And Hygienists Had A Higher Rate Of Vaccination (82 Per Cent And 81 Per Cent, Respectively) When Compared To Dental Assistants (41 Per Cent; $P < .001$). Acceptance Of Infection Control Procedures Was High, With 92 Per Cent Of Participants Reporting Use Of Gloves For All Patients And 82 Per Cent Reporting Use Of Masks And Eye Protection.

SOMMAIRE

En juin 1990, les professionnels dentaires présents au Congrès annuel du Collège royal des chirurgiens dentistes de la Colombie-Britannique ont été invités à participer à un sondage visant à calculer le nombre de personnes qui sont

infectées par les virus de l'hépatite B, de l'hépatite C et du sida, qui ont accepté de se faire vacciner contre l'hépatite B et qui se conforment aux directives pour réduire les risques d'infection. Libre et anonyme, le sondage exigeait des participants qu'ils remplissent un questionnaire et se soumettent à une prise de sang. Sur les 1 995 congressistes, 401 ont participé au sondage. Sur les quatorze qu'on a trouvés infectés par le virus de l'hépatite B, treize avaient développé des anticorps aux antigènes d'enveloppe et aux antigènes nucléocapsidiques du virus de l'hépatite B et un se montrait positif aux antigènes d'enveloppe de l'hépatite B. Une personne portait des marqueurs tant de l'hépatite B que de l'hépatite C. Personne n'était séropositif. Soixante-sept p. cent des participants s'étaient fait vacciner contre l'hépatite B, les dentistes et les hygiénistes comptant pour 82 et 81 p. cent respectivement contre 41 p. cent ($p < .001$) pour les assistantes dentaires. Quant aux directives pour réduire les risques d'infection, la plupart étaient en faveur, 92 p. cent ayant déclaré porter des gants et 82 p. cent des masques et des lunettes.

Introduction

Dental professionals have long been recognized to be at increased risk for occupational acquisition of infectious diseases. The high infection rate of Hepatitis B virus (HBV) in dentists, dental hygienists and dental assistants is well established,^{1,2} and transmission of HBV from dentist to patients is also documented.^{3,4} These observations prompted the formulation of simple guidelines for infection control in the dental office,⁵ which were expanded in 1982 to include HBV vaccine⁶ and currently have been developed into detailed recommendations.⁷⁻¹⁰ However, acceptance of infection control procedures and

vaccination has been slow. The epidemic of Human Immunodeficiency Virus (HIV) infection, and the recognition that this virus is also spread through infected blood, have been acknowledged to be of greater impetus than the fear of HBV for the implementation of infection control procedures in dentistry.¹¹⁻¹³

The report of possible transmission of HIV from a dentist to patients^{14,15} has heightened concern about the potential for HIV transmission in the dental setting, and further emphasized the importance of infection control measures. These cases raise particular concern since, by report, there was no known transmission of blood during treatment and recommended barrier precautions were followed.

The purpose of this study was to assess the prevalence of infection with HBV, Hepatitis C virus (HCV) and HIV, acceptance of vaccination against HBV, and use of infection control procedures by dental professionals in British Columbia.

Methods

The survey took place during the annual meeting of the College of Dental Surgeons of British Columbia, held in June 1990 in Vancouver, B.C. Dental professionals attending the meeting were informed of this survey in advance through a publicity brochure and at the meeting by announcements and an information booth. Participation was strictly anonymous and voluntary, and required both the completion of a 45-item, self-administered questionnaire and the donation, on site, of a blood sample to test for markers of infection with HBV, HCV and HIV. Items in the questionnaire were intended to provide information about participant demographics, HBV immunization, perception of practice demographics, and both individual and office infection control procedures. Confidentiality and ano-

nymity were maintained by assigning a unique code number to each volunteer participant, known only to them, which identified the questionnaire and blood sample and was used to obtain the results of individual blood tests. Investigators were available to answer questions, but were unable to identify any participant, questionnaire or blood sample except by code number. Most information was given by telephone rather than in person which further ensured volunteer anonymity.

Serological tests for HBV, including Hepatitis B surface antigen (HBsAg), antibody to Hepatitis B core antigen (anti-HBc), and antibody to Hepatitis B surface antigen (anti-HBs) were performed overnight, and the remaining tests were completed within four weeks. All assays were done using enzyme immunoassay methodology with test kits from Abbott Laboratories (Chicago, Illinois). All positive results were confirmed by repeat testing, with the exception of positive anti-HBs results.

Statistical tests of significance were performed using Chi Square, Fisher's exact, or student t-test, as appropriate. The level of significance was set at $p < .05$. Data were compared to information gathered during the annual meetings of the same organization in 1987 and 1988, a more complete analysis of which has been published elsewhere.¹⁶

HBV status of participants was defined as follows: 1) susceptible – all serological tests negative, 2) infected – anti-HBc or HBsAg positive, 3) immune – presence of anti-HBs, either after natural infection or vaccination, with titer greater than 10 mIU.

Results

The 1990 B.C. Dental Convention was attended by 1,995 individuals, of whom 401 (20 per cent) volunteered to participate in the study. All volunteers submitted a blood sample and completed a questionnaire, but did not necessarily answer every item on the questionnaire. Subsequently, response rates could be determined for responders only and denominators will vary. Response rates were greater than 90 per cent and often greater than 95 per cent for the majority of items. Unusually poor response rates were noted.

Participant demographics

The participants consisted of 131/383 (34 per cent) males and 252/383 (66 per cent) females, with a mean age of 35.5 years (males 41 years, females 33 years). Most participants were dentists (157/394, 40 per cent),

followed by dental assistants (134/394, 34 per cent), and hygienists (75/394, 19 per cent). The remaining seven per cent were primarily students of all professional groups, and others who perform various functions within the dental profession, including laboratory, secretarial and bookkeeping personnel. Eighty-nine per cent of participants were Caucasian, with Orientals and other non-Caucasians comprising 11 per cent. Most participants practised in Vancouver (39 per cent) and the lower mainland of B.C. (31 per cent), with 12 per cent from Vancouver Island, 14 per cent from the rest of B.C. and four per cent from outside the province. More than half of the participants (52 per cent) had been in practice for 10 or more years, 21 per cent had been practising for five to nine years, 25 per cent had been practising one to four years, and two per cent under one year.

Practice demographics

Eighty-seven per cent of participants reported taking a patient history and most updated the history over time. Patient demographic data with regard to risk factors for blood-borne disease were reported by participants as follows: patients known to be HBsAg carriers, 251/380 (66 per cent); those in high-risk ethnic groups for HBV, 178/359 (50 per cent); those known to be hemophiliacs, 84/357 (24 per cent); patients on dialysis, 72/357 (20 per cent); male homosexuals, 176/371 (47 per cent); and patients known to be HIV positive, 105/368 (29 per cent). Note that these numbers do not represent the prevalence of these risk factors in the population, since more than one convention attendee from the same dental practice may have participated.

Infection with HBV, HCV and HIV

Fourteen participants had evidence of infection with HBV, for an overall prevalence in this group of 14/401 (four per cent). When infected persons are compared to the population at risk only (ie. those not immunized who actually are the susceptible group), the infection rate increases to 10 per cent (14/146). One participant, a Caucasian female dental assistant in practice for more than 10 years, was HBsAg positive. Thirteen participants had evidence of prior infection with presence of both anti-HBc and anti-HBs. Dentists had the highest overall prevalence of infection, 9/157 (six per cent), compared to hygienists, 2/75 (three per cent), dental assistants, 2/134 (two per cent), and others (0 per

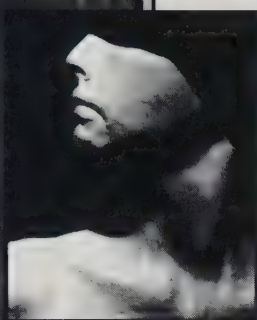
cent). Non-immunized dentists, hygienists, and assistants had infection rates of 9/29 (31 per cent), 2/14 (14 per cent), and 2/79 (three per cent), respectively. The prevalence of infection in non-Caucasians, 4/42 (10 per cent), was increased compared to the prevalence in Caucasians, 10/351 (three per cent). Other factors including age, years of practice, number of reported sharps injuries, history-taking practices or practice demographics as perceived by the dental professional, were not associated with a significant difference in infection prevalence. Participant use of infection-control procedures was not evaluated with regard to infection rate since this information was applicable to current behavior and thus not necessarily associated with past risks for exposure. Questions regarding personal risk factors for blood-borne infections were answered by 97 per cent of participants. Blood or blood products had been received by 29 (eight per cent) since 1977; two admitted sexual contact with a male homosexual; and one admitted use of non-prescription intravenous drugs. Of the 14 participants positive for HBV infection, the only personal risk factor reported was the receipt of blood or blood products, and this by three of the 14. One participant was found to have markers for both HBV and HCV. No participant tested positive for anti-HIV by ELISA.

Immunization

Awareness of HBV vaccine was acknowledged by 97 per cent of the participants. Overall, 255/397 (64 per cent) reported that they had received the HBV vaccine and most (80 per cent) had begun immunization more than six months before this survey.

The vaccination rates for dentists, 128/157 (82 per cent), and hygienists, 61/75 (81 per cent), were essentially the same. This rate was significantly higher than the vaccination rate of dental assistants, 55/134 (41 per cent); $p < .001$. There were no significant differences in vaccination rates when evaluated by years of practice, practice location, or reported number of sharp-instrument injuries. Vaccination was received by 133 participants (76 per cent) who reported that their practices had ethnic groups known to be at high risk for HBV, compared to 100 (56 per cent) who didn't know or didn't think their practices had high-risk ethnic groups ($p < .001$).

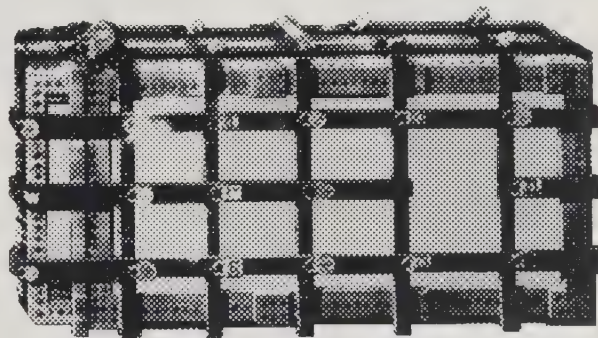
One hundred nineteen participants gave reasons for their failure to be vaccinated. The most common responses indicated that some participants felt the vaccine was too expensive (18 per cent)



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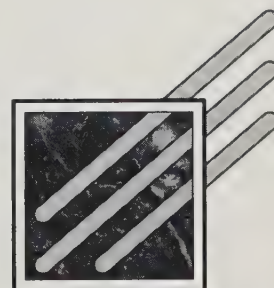
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or not necessary in their situation (15 per cent), while others indicated that there was not enough information available about the vaccine (15 per cent) or that they were currently pregnant or planning pregnancy (15 per cent). Ten (eight per cent) stated that they were too lazy or procrastinated, and four (three per cent) stated that they didn't have the opportunity. Eight (seven per cent) were concerned about possible allergy and 13 (11 per cent) feared other side effects. Of those employed in activities not involving patient contact, 70 per cent responded that the vaccine was not necessary in their situation.

Of the 255 vaccinees, 196 (77 per cent) had anti-HBs titers greater than 10 mIU – considered a protective level. Of the 59 vaccinees with anti-HBs less than 10 mIU, six had not completed the recommended three-dose primary schedule. In the 21 per cent who received vaccination as recommended but who did not have protective antibody levels, it cannot be determined in a survey of this design if these were primary non-responders or if immunity had developed but subsequently waned.

Infection Control

The overall response rate to questions on infection control was greater than 95 per cent. Reported compliance – including use of gloves, eye protection, and masks – is tabulated in **Table I**, with further details regarding participant glove practices in **Table II**. Use of disinfection and sterilization procedures is outlined in **Table III**. The relatively low (63 per cent) response rate to the item regarding sterilizable handpieces reflects the fact that not many dental offices have acquired this instrument to date. Penetrating injury from a needle, drill or other sharp instrument in the six months prior to the survey was denied by 155/368 (42 per cent), but one to five such injuries were reported by 194 (53 per cent) and greater than five were reported by 19 (five per cent).

Discussion

The results of this survey seem to indicate that the dental professionals attending their annual meetings in British Columbia have demonstrated a heightened awareness about the potential for transmission of infectious diseases in the dental care setting. This is suggested by the reported increase in compliance with infection-control prac-

tices and vaccination against HBV. The prevalence of HBV infection in this group as a whole was four per cent, which increases dramatically to 10 per cent when the rate in the unvaccinated population is determined. These compare to infection rates of nine per cent (overall) and 11 per cent (unvaccinated group) in the 1988 survey. The infection rates in the unvaccinated group are actually more meaningful figures to assess risk and have not changed in the interval period. Evidence for HCV infection was found in only one individual. HIV infection was not detected, despite practice in areas where HIV infection is present and exposure to HIV-infected patients occurs. The relatively low participation rate cautions against forming global statements; nonetheless, our results are consistent with other reports that occult HIV infection in this population is low.¹⁶⁻¹⁸

These survey results are encouraging, but conclusions must be tempered by the inherent limitations in this study, including sensitive subject matter, recruitment of participants on a volunteer basis, and the self-administered questionnaire format. The subject material may be responsible for a low participation rate as noted, and may have also

TABLE I:

Use Of Infection Control Procedures By Professional Groups

	Gloves n, (%)	Eyewear* n, (%)	Masks n, (%)
Worn by			
Dentists			
All Patients	130 (86) ¹	131 (87) ²	125 (81)
High Risk	14 (9)	7 (4)	11 (7)
Sometimes	6 (4)	10 (7)	13 (9)
Never	2 (1)	3 (2)	5 (3)
Hygienists			
All Patients	73 (100) ³	64 (87) ⁴	65 (90)
High Risk	0	5 (7)	7 (10)
Sometimes	0	2 (3)	0
Never	0	2 (3)	0
Assistants			
All Patients	126 (95) ⁵	94 (71) ⁶	104 (79)
High Risk	3 (2)	9 (7)	9 (7)
Sometimes	4 (3)	14 (11)	13 (9)
Never	0	15 (11)	6 (5)

p calculated by comparing use of a particular infection control practice for all patients, against use for all other occasions combined.

1 vs 5, 4 vs 6: p <.025

1 vs 3, 2 vs 6: p <.005

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TABLE II:

Use of Infection Control By Professional Groups

Glove Practise	Dentists n, (%)	Hygienists n, (%)	Assistants n, (%)
New Gloves Each Patient	92 (62) ¹	64 (88) ²	94 (72) ³
Wash Gloves Between Patients	57 (38)	9 (12)	36 (28)
1 vs 2, p < .001, p calculated for new glove use only			
2 vs 3, p < .025, p calculated for new glove use only			

introduced a non-response bias with high-risk persons selecting themselves out of the survey. Less than one per cent of participants admitted to high risk behavior, but this may not differ from the average for this population. It is true that HIV seroprevalence may be underestimated if those who knew themselves to be infected or at risk declined to participate. However, we were interested in determining the prevalence of infection in those individuals who did not suspect they would be infected because they lacked other identified risk factors. These individuals, if seropositive, would likely be infected due to occult occupational transmission. We feel our data

provides useful information in this regard.

Recruitment of volunteers was not done in a way to encourage participation by those who had been part of previous surveys. In 1988, less than five per cent were repeat participants from 1987, and we feel this can be extrapolated to the current survey. With this premise, we feel these surveys represent cross-sectional data from the same general population of dental health care professionals. We do recognize that those who choose to participate in all years may have a greater interest in the subject and thus may be knowledgeable and concerned about study issues. This may influence results, particularly regarding

infection control, and compliance with recommended practices may appear better than it is in actual fact. Self-reporting of practices may bias responses to those which participants thought were more appropriate or were the right answers, rather than reporting actual practices.

While these problems may temper comments on our observations, some trend differences in the behavior of dental professionals in the two-year period in the same setting bear mention. The overall vaccination rate increased significantly ($p < 0.1$) from a rate of 50 per cent in 1988 to a rate of 68 per cent in 1990. This trend is comparable to that reported from the screening of dental professionals done as part of the American Dental Association Health Screening Program.¹⁸ In both surveys, there were significantly fewer vaccinees among dental assistants compared to dentists and hygienists. This may reflect that, for the most part, assistants tend to be younger, perhaps less well informed, and may actually have less patient contact and view themselves as being at less risk. While all dental professionals should continue to be encouraged to receive HBV vaccination, perhaps dental assistants need to be a special target of educational efforts. The importance of vaccination as a protective measure is emphasized by the dramatic difference in infection rates when one looks at immunized versus non-immunized dental professionals. The ever-

TABLE III:

FREQUENCY OF DISINFECTION AND STERILIZATION PROCEDURES IN THE DENTAL OFFICE

	Disinfect				Sterilize	
	Chair (n = 368)	Exposed Surfaces (n = 370)	Motorized Handpieces (n = 369)	Hand Instruments (n = 338)	Autoclavable Handpieces (n = 256)	Hand Instruments (n = 366)
After Each Use	61%*	85%	98%	97%	66%	99%
With Visible Soiling	19	8	<1	<1	7	—
End of Day	17	6	1	1	27	1
Rarely	3	1	1	2	—	—
*Percentage calculated as the number answering each response/total number who answered that item on the questionnaire (n).						

present hazard of a penetrating injury from a needle, drill or other sharp instrument, reported by more than half of the participants and not protected against by use of barrier precautions, makes immunization even more essential.

Reasons for failure to be vaccinated against HBV were similar in both surveys and provide some insight into the effectiveness of educational efforts. Encouragingly, in 1990 more participants thought there was enough information about the vaccine available. Despite higher vaccination rates, it is of some concern that more progress has not been made to dispel some unwarranted concerns about the vaccine.

When only those participants not immunized were considered, infection rates are similar to the study two years ago. Differences in infection rate with HBV may not be seen over this short time period and with such small numbers. The exception to this may have been younger individuals who have taken advantage of HBV vaccine, but our numbers were too small to note significant differences in this regard. In both surveys, the factor most strongly associated with HBV infection was a non-Caucasian heritage.

Perception by dental professionals of practice demographics has changed somewhat in the study interval. This probably reflects both their heightened awareness of infectious disease transmission and an actual increase in HIV prevalence. Compared to 1988, in 1990 a larger percentage of dental workers identified patients in their practice who were carriers of HBsAg (50 per cent versus 66 per cent; $p < .001$), who were infected with HIV (12 per cent versus 29 per cent; $p < .001$), or who were homosexual (39 per cent versus 47 per cent, $p < .001$). It is interesting to note that changing perceptions of practice demographics influenced behavior. In 1988, there was no difference in vaccination rate between those who identified high-risk ethnic groups for HBV in their practices and those who did not, compared to 1990 when there was a significant difference in vaccination rates between these two groups.

In recent years, infection control in the dental office has received intense scrutiny, and major national medical and dental organizations have produced guidelines.⁸⁻¹¹ These organizations are to be commended for an extensive educational program to reduce the transfer of communicable diseases, particularly HBV and HIV, between patients and dental personnel. Based on the principle that history and examination cannot reliably identify all patients infected with

blood-borne pathogens, the following infection control procedures are recommended for all dental patients:

1. All dental personnel should wear latex examination gloves, surgical masks and protective eye wear to prevent contamination from blood and saliva.
2. Hands should be washed thoroughly with a germicidal soap prior to and immediately after the use of gloves.
3. All instruments and handpieces used in the oral cavity should be sterilized when possible; if not sterilizable, they must receive appropriate high-level disinfection.
4. Exposed surfaces in the dental operatory touched or splattered by aerosols or blood should be disinfected by a suitable chemical germicide.
5. Sharp items should be disposed of in puncture-resistant containers. Disposable waste should be placed in sturdy plastic bags and discarded in accordance with local policy.

Results of this and other studies that have examined changes in compliance to infection control guidelines are encouraging and vindicate the educational efforts of the national organizations. Compared to the previous studies by the authors,¹⁶ this survey showed an increase in glove use for all patients from 69 per cent to 92 per cent, and in mask use from 56 per cent to 82 per cent. Use of eye wear was difficult to interpret since it is not known whether it was to correct vision or for infection control, but eye wear use was reported by more than 80 per cent in both studies. Similarly, a national survey of American dentists¹² in 1986 and repeated in 1988 showed an increase in glove use for all patients from 23 per cent to 76 per cent, in mask use from 26 per cent to 47 per cent, and in use of protective eye wear from 77 per cent to 82 per cent. The findings of surveys in Minnesota¹⁹ and Canada²⁰ indicate that all dental professionals made dramatic changes in the routine use of barrier techniques between 1985 and 1988. However, we note that when compared to hygienists, dentists were less likely to wear gloves with all patients and less likely to wear a new pair of gloves with each patient. This was not commented upon in either of the previous studies.

Data to compare changes in compliance to guidelines relating to instrument and surface decontamination are very limited. A 1986-88 American survey found that knowledge of sterilization and disinfection techniques, as well as handling of equipment and waste, was disappointing.¹² Our survey, albeit more limited in scope and numbers, provided data in this area (Table III). With the

exception of the use of autoclavable handpieces, compliance with the recommended guidelines is very high. Similar to the American survey, our survey showed that over one-third of dental offices still use non-sterilizable handpieces. Reasons for this are not documented, but it is likely that the expense of purchasing replacement equipment is the major factor. It is expected that new autoclavable handpieces will be purchased in the future as the need to replace or repair existing non-sterilizable handpieces increases. Meanwhile, we note that 98 per cent of dental offices in this survey are disinfecting handpieces after each patient. It was not investigated which methods of disinfection or sterilization were used.

In this study, 85 per cent of dental personnel reported disinfection of exposed surfaces after each patient regardless of the procedure performed. It was not surprising to find that disinfection of the dental chair took less priority than other exposed surfaces since many modern chairs have fabric coverings. Disinfection of exposed surfaces, including the dental chair, is discussed by Hardie,¹³ Molinari et al,²¹ and Scarlett.²² These authors indicate that there is little epidemiological evidence of disease transmission from environmental surfaces and minimal scientific validity for using potent chemicals as surface disinfectants. Most guidelines state that it is satisfactory to pre-wipe contaminated surfaces with a detergent or a mild chemical disinfectant, followed by a second application which is allowed to dry. However, Christensen et al²³ suggest further review of these recommendations now that disinfectants have been identified that penetrate and kill microbes within heavy bioburden.

Conclusion

The potential for transmission of blood-borne viruses between patients and the dental health care provider will continue by virtue of procedures necessary to provide dental treatment. This risk has been recognized for well over 15 years, but until the recent epidemic of HIV infection, attitudes toward infection control and use of the HBV vaccine were poor. Consistent with trends elsewhere, this survey reveals increasing acceptance of HBV vaccine and compliance with infection control procedures. HCV and HIV seem to be rare in dental professionals who do not have other commonly identified risk factors.

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Reprint requests to **Dr. Noble**.

References

1. Mosley, J.W., Edwards, V.M., Casey, G. et al. Hepatitis B Virus infection in dentists. *N Engl J Med* 293:729-734, 1975.
2. Epstein, J.B., Buchner, B.K. and Bouchard, S. Hepatitis B and Canadian dental professionals. *J Canad Dent Assn* 50:555-559, 1984.
3. Ahtone, J. and Goodman, R.A. Hepatitis B and dental personnel: Transmission to patients and prevention issues. *JADA* 106:219-222, 1983.
4. Shaw, F.E., Barrett, C.L., Hamm, R. et al. Lethal outbreak of Hepatitis B in a dental practice. *JAMA* 255:3260-3264, 1986.
5. Council on Dental Materials and Devices, Council on Dental Therapeutics. Infection control in the dental office. *JADA* 97:673-677, 1978.
6. American Dental Association. ADA Council recommends hepatitis vaccine for dentists, students, auxiliary personnel. *ADA News* 13:1-8, 1982.
7. Center for Disease Control. Recommended infection control practices for dentistry. *MMWR* 35:237-242, 1986.
8. Canadian Dental Association. Recommendations for infection control procedures. *J Canad Dent Assn* 54:383-384, 1988.
9. American Dental Association. Infection control recommendations for the dental office and the dental laboratory. *JADA* 116:241-248, 1988.
10. Canadian Dental Association Board of Governors. Implementation of the recommendations for infection control procedures. April, 1989.
11. Neidle, E.A. AIDS-related changes in dental practice. *J Dent Educat* 53:525-528, 1989.
12. Verussio, A.C., Neidle, E.A., Nash, K.D. et al. The dentist and infectious diseases: a national survey of attitudes and behavior. *JADA* 118:553-562, 1989.
13. Hardie, J. An update on human immunodeficiency virus and infection control. *J Canad Dent Assn* 56:423-426, 1990.
14. Centers for Disease Control. Possible transmission of human immunodeficiency virus to a patient during an invasive dental procedure. *MMWR* 39:489-493, 1990.
15. Centers for Disease Control. Update: Transmission of HIV infection during an invasive dental procedure - Florida. *MMWR* 40:21-23, 1991.
16. Noble, M.A., Gibson, G.G., Mathias, R.G. et al. Hepatitis B and HIV infection in dental professions: Effectiveness of infection control procedures. *J Canad Dent Assn* 57:55-58, 1991.
17. Klein, R.S., Phelan, J.A., Freeman, K. et al. Low occupational risk of human immunodeficiency virus infection among dental professionals. *N Engl J Med* 318:86-90, 1988.
18. Siew, G., Gruninger, S.E., Chang, S.B. et al. Risk of HIV and Hepatitis B among dental professionals. *J Dent Res* 68:415, 1989.
19. DiAngelis, A.J., Martens, L.V., Little, J.W. et al. Infection control practices in Minnesota dentists: changes during one year. *JADA* 118:299-303, 1989.
20. Hardie, J. Infection control survey - 1988. A Canadian Dental Association project. *J Canad Dent Assn* 55:299-301, 1989.
21. Molinari, J.A., Gleason, M.J., Cottone, J.A. et al. Cleaning and disinfectant properties of dental surface disinfectants. *JADA* 117:179-182, 1988.
22. American Dental Association. Infection control procedures and products: Cautions and common sense. *JADA* 117:293-301.
23. Christensen, R.P., Robison, R.A., Robinson, D.F. et al. Antimicrobial activity of environmental surface disinfectants in the absence and presence of bioburden. *JADA* 119:493-505, 1989.

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The issues of chemical dependency in dentistry

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ABSTRACT:

The problem of chemical dependency is a topical issue in society today. With the increase in the number and types of prescription drugs, the proliferation of illegal drugs, and easy access to alcohol, chemical dependency has no socioeconomic boundaries. Professionals, blue collar workers and students, both male and female, are susceptible to the problem. The purpose of this paper is to review the literature on chemical dependency as it relates to the profession of dentistry. It will also look at the definition, prevalence, etiology, recognition, treatment and prevention of chemical dependency. Most of the evidence from the literature indicates that chemical dependency is a disease; it is treatable and can be prevented. The treatment of the disease requires the input of support groups at the professional level as well as at student level. The prevention of chemical dependency must begin in the curricula of dental schools with emphasis on the pharmacology and interaction of drugs.

SOMMAIRE

Aujourd'hui, la dépendance envers les produits chimiques constitue un problème social. Avec la variété et le nombre croissants de drogues prescrites, la prolifération des drogues illicites et la facilité de se procurer de l'alcool, ce genre de dépendance ne connaît plus de frontières socio-économiques. Professionnels, cols bleus et étudiants, autant les hommes que les femmes, tous sont susceptibles d'avoir ce problème. Dans cet article, on révisé les publications sur la dépendance envers les produits chimiques dans la profession dentaire. On se penche également sur la définition, la prévalence, l'étiologie, la dépendance envers les produits chimiques. D'après les différentes publications sur le sujet, il s'agit d'une maladie qui se traite et peut être prévenue.

Son traitement exige l'appui de groupes tant de professionnels que d'étudiants. La prévention doit commencer durant les études, l'importance devant être accordée à l'interaction des drogues.

Chemical dependency, alcohol and drug abuse, have been societal problems for generations.¹ While the early research literature in this area dealt mainly with society in general, studies were undertaken within the medical profession in the mid 1950s. Several authors subsequently concluded that the incidence of chemical dependency was higher among medical practitioners than it was among the general population.²⁻⁴ In 1975, these studies prompted the American Medical Association (AMA) to convene a national meeting to address the problem of chemical dependency and to recommend steps to deal with it.⁵

The American Dental Association (ADA), as part of its mandate from the ADA House of Delegates and the Council on Dental Practice, finally presented a report on chemical dependency within the dental profession in 1979, four years later.⁶ This report defined chemical dependency and expressed concern over its incidence within the dental profession.

While the problem of chemical dependency has been recognized in the dental profession in the United States, there is a need for increased awareness of the problem within the Canadian dental profession. This article attempts to summarize some of the issues.

Definition

Chemical dependency can be defined as the continued use and abuse of chemicals by an individual, despite repeated adverse consequences to self and others as a result of that behavior.⁷ The World Health Organization (WHO) has gone one step further, by defining chemical dependency as a disease.⁸ This classification reflects the fact that the

condition: 1) has a recognizable group of signs and symptoms; 2) follows a predictable and progressive course and, if untreated, may result in death; 3) produces consistent anatomic and/or physiologic alterations; 4) results from a cause or causes that may not yet be known; and 5) is a primary condition, not merely a symptom.⁹

Prevalence

Recent studies indicate that eight to 15 per cent of all health care professionals will suffer varying degrees of impairment from chemical dependency.¹⁰ The National Council on Alcoholism in the United States estimates that the percentage of alcoholics among professionals is one and one-half times greater than it is among nonprofessionals.¹¹ Therefore, assuming that the dental profession is no less susceptible to alcoholism than the general population, one out of every 10 dental professionals who drink has an alcohol problem. (Since Canada follows many of the trends of the United States, one may assume that these problems apply equally to the Canadian dental professional.)

Alcohol (ethanol) is the preferred drug for the majority of chemically-dependent individuals, although, over the last 30 years there has been a resurgence in the use of other drugs.⁸ A 1983 survey by Alcoholics Anonymous in the United States indicated that 31 per cent of all alcoholics had been addicted to one or more drugs in addition to alcohol. Barbiturates, narcotic analgesics and stimulants were the most frequently used drugs in this category. Reports also indicate that the use of hard drugs, marijuana and cocaine among the general North American population has increased in the last 10-15 years.

Etiology

The potential causes of chemical dependency are complex and multifactorial.⁸ A combination of biological, psychological and social influences are thought to be involved in the etiological process.¹²

Biological

Heredity is a major contributing cause of chemical dependency.⁸ Studies have shown that sons of alcoholics are three to four times more at risk for alcoholism than the sons of nonalcoholics.¹³ Furthermore, when compared with the sons of nonalcoholics, the sons of alcoholics were also more susceptible to adult psychiatric disturbances, such as depression and sociopathy.¹³ The strongest predictor of future chemical dependence appears to be a family history of chemical dependency.¹⁴

Psychological

Studies on alcoholism have found that most alcoholics do not appear different from non drinkers in terms of psychological stability.¹⁵ A number of behavioral scientists view chemical dependency as a learned behavior and a maladaptive attempt to reduce anxiety.¹⁶ Along the same lines, some researchers view alcoholics or drug addicts as people who have failed to achieve the kinds of social acceptance, competence and personal autonomy that are the minimal expectations of individuals and of society.¹⁷ While chemical dependency has been regarded as a moral issue in the past, health care professionals are increasingly accepting this psychosocial manifestation as a symptom, and not the cause, of the disease.¹⁸

Sociological

Chemical dependency is a major unresolved social and medical problem in North America today.¹⁹ There is evidence that the socioeconomic background of alcoholics has an influence on their becoming addicted. In addition, there are psychosocial consequences for the family members of the chemically dependent who, because of their own risk of addiction, require special treatment needs at a very high cost to society.

The demands of society on the dental practitioner have increased substantially in recent years, contributing to higher stress levels, which in turn may be a contributing factor in the onset of chemical dependency. Society's perception of the dentist as one above reproach contributes to a sense of anxiety in the dental practitioner.

Effects

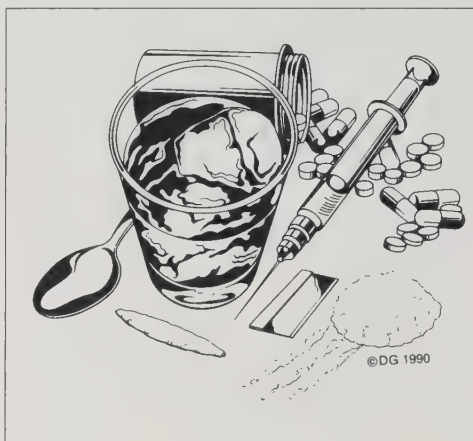
The literature on chemical dependency suggests that problems usually manifest themselves in four general areas.²⁰

Family

The family is usually the first unit to suffer. As the disease progresses, the chemically dependent individual becomes withdrawn from family activities. Tension between spouses often leads to arguments, family tension, marital breakups and divorce. Child abuse and child behavioral problems are also manifestations of chemical dependency.

Community

As chemical dependency progresses, it often results in the individual withdrawing from community activities, and other unpredictable and sometimes embarrassing behavior. Friends are shut out and avoided, and attendance at community functions ceases.



Personal Health

If the disease is left untreated, the health of a chemically dependent individual deteriorates. Appearance and personal hygiene worsen, and often the chemically dependent person turns to other drugs to relieve health problems.

Dental Practice

One of the last areas to be affected by chemical dependency is often the practice. As the disease progresses, there is a marked change in performance, marked by frequent absenteeism and erratic behavior and leading to a loss of patients. This change in performance leads to stress and tensions among the staff, which also have an adverse affect on the practice.

Recognition

Early recognition of chemical dependency is important because it interrupts the impact on the victim, the family and the chemically dependent person's vocation. The major stumbling blocks to early recognition are denial and enabling – denial by the afflicted and enabling by friends, co-workers and family. Denial is a psychologic defense

mechanism that blocks the reasoning powers of the victim. Enablers are those closest to the chemically dependent; usually spouses, colleagues, and children. They help these individuals to remain in their dependency by making excuses for them, protecting them and covering up for them.

There are a number of clues that can be used to identify a chemically dependent person.²¹ These are:

- (1) isolation and withdrawal from community and family activities.
- (2) deterioration in personal hygiene and in clothing and dressing habits.
- (3) disruption of appointment schedule.
- (4) unexplained absences from the practice.
- (5) excessive ordering of drugs.

Treatment

Chemical dependency is indeed a treatable disease. Early identification and intervention can often produce successful outcomes, but chemical dependency is not curable, as the chemically dependent individual is always in recovery.⁸ The important elements of any treatment program are the support systems available to the addict. These systems must include family, community, employers, and professional groups, as well as such groups as Alcoholics Anonymous, Narcotics Anonymous, and Al Anon. Studies have shown that long-term recovery is predicated on finding a substitute dependency to replace drugs, discovering a fresh source of hope and self-esteem, and obtaining new social supports.²² The complexity of substance abuse demands that treatment protocols are based on the fact that there are many variables in the medical and psychiatric condition and in the patterns and consequences of substance abuse.²³

Prevention

In addition to treating the victims of chemical dependency, there is a need to focus on the prevention of the disease. Education is extremely important. An educational program should involve information on the pharmacology of drugs, the identification of problems, intervention techniques and treatment methods available. The ADA report of 1979 included in its recommendations the need for the establishment of state programs for the recognition, identification and treatment of chemical dependency, as well as the inclusion of the problem in the curricula of dental schools. As a result of this report, a

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number of state support programs were established for dental practitioners.

A number of dental schools in the United States have followed suit, establishing student support programs and introducing course material on chemical dependency into their curricula. A poll of Canadian dental schools, however, revealed that none currently have student support programs or offer course material related to chemical dependency.

Three provincial dental societies in Canada — those of British Columbia, Ontario and Nova Scotia — have implemented support programs for the dental practitioner. The Nova Scotia program is unique in that it is not only a combined support program, linking the medical and dental associations, but it also includes student representation from the faculties of medicine and dentistry.

Summary

The literature seems to support the premise that chemical dependency is a disease of great complexity with no known specific cause. It is not confined to any one socioeconomic group nor are there any ways to predict who will succumb to the disease.

While there are encouraging signs in the detection, treatment and prevention of substance abuse, as well as in rehabilitation, it is clear that more needs to be done. As more dental societies become involved, more assistance will be available to help dependent colleagues.

Perhaps one of the answers is education, which should begin with the dental team and extend down to the students. Student support programs should be encouraged by dental societies and faculties, and issues of chemical dependency should be introduced into dental school curricula.

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References

1. Council on Dental Practice. Chemical dependency and dental practice. *JADA* 114:509-515, 1987.
2. Modlin, M. and Montes, A. Narcotic addiction in physicians. *Am J Psychiatr* 121:358-365, 1964.
3. Pearson, M. Drug and alcohol problems in physicians. *Psychiatr Opin* 12:14-18, 1975.

4. Putnam, P. and Ellinwood, E. Narcotic addiction among physicians: A ten year follow-up. *Am J Psychiatr* 122:745-748, 1966.
5. Canavan, David J. The impaired physicians' program. *J Med Soc New Jersey* 80:205, 1983.
6. ADA House of Delegates (Trans. 1979:626; 1984:534, 535).
7. Talbot, G.D. The disease of chemical dependence from concept to precept. *The Counselor*, July/Aug. 18-19, 1983.
8. Peters, A.C. and Oberg, S.W. Association Reports, *JADA* 114, April 1987.
9. Miers, Dennis P. and Smith, Doyle P. Guidelines for the treatment of recovering chemically dependent dental patients. *J Am Coll Dent* 56 (1), 1989.
10. Sandoval, V.A., Hendricson, M.A. and Dale, R.A. A survey of substance abuse education in North American dental schools. *J Dent Educ* 52(3), 1988.
11. Peterson, R.L. The impaired dentist. What Michigan dentists report. *J Mich Dent Assoc*. 69:203-212, 1987.
12. Goldstein, F.J. Substance abuse in the health profession. *Comp Cont Educat Dent*, June 8(6) 438:442-444, 1987.
13. Goodwin, D.W. Alcoholism and genetics. *Arch Gen Psychiatr* 42:171-174, 1985.

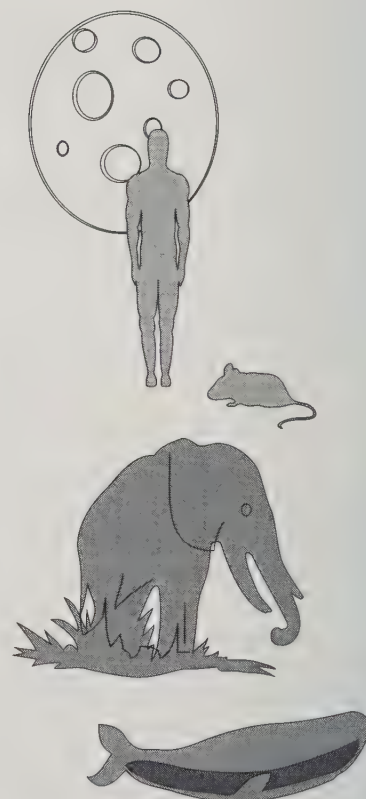
14. Oberg, S.W. Chemical dependency. *J Am Coll Dent* 56:Fall, 1989.
15. Clarno, John C. The impaired dentist. *Dent Clin N Am* 30, Oct. 1986.
16. Sandrin, N. Self abuse. *Today's Health*, Oct. 1990.
17. Alexander, B. *Peaceful Measures: Canada's Way Out of the War on Drugs*. University of Toronto Press, 1990.
18. Vaillant, C.E. *The Natural History of Alcoholism*. Cambridge, Mass., Harvard Press, 1983.
19. Jansen, B.S. *Social Welfare Policy*. Belmont Co. Wadsworth Publishing Company, 1984, pp 68-94.
20. Rankin, J.G. Problems of alcohol and drug use among physicians. Physician in Chief of the Addiction and Research Foundation, Toronto, 1988.
21. Arthur, M.S. Drug and alcohol abuse: Dentists call for help. *Dental Management*, July 1982, pp. 45-48.
22. Beckland, F. *Evaluation of treatment methods in alcoholism: The Rehabilitation of the Chronic Alcoholic*. New York, Plenum Press, 1977.
23. Medical Society of Nova Scotia/Nova Scotia Dental Association Policy Statement: The Treatment of Chemically Dependent Professionals, February 1988.

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Utilization of dental services by older adults in four Ontario communities

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ABSTRACT

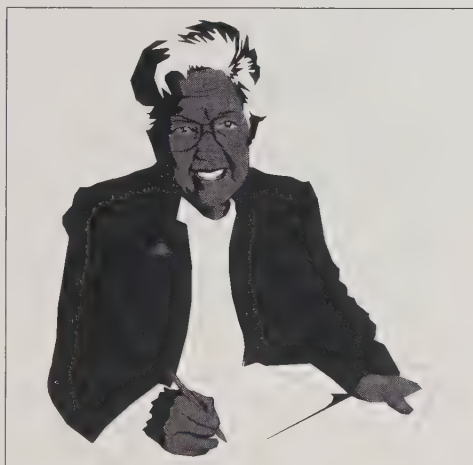
The elderly tend to use dental services less than most younger age groups. While the elderly's utilization rates may be rising, very low utilization by edentulous people depresses the overall rate for the group. We use data from the Ontario Study of the Oral Health of Older Adults to identify the variations in the use of dental services in the four study sites of Toronto, North York, Simcoe County and Sudbury and District. We reached 3,033 subjects by telephone and conducted dental examinations and a multi-item personal interview with 907 of them.

The 907 subjects ranged in age from 50 to 87 years, 57 per cent were female and two-thirds were born in Canada. Overall, 60.5 per cent had seen a dentist or denturist in the previous year, but this was much lower among the edentulous (17 per cent) when compared to the dentate (72 per cent) (Chi-square test; $p < .0001$). Of the 357 who did not visit a dentist or denturist in the previous year, nearly half (48 per cent) felt they had nothing wrong and 20 per cent reported they could not afford care. A high proportion (94 per cent) of the edentulous reported visiting only for pain or trouble compared to 26 per cent of the dentate (Chi-square test; $p < .0001$). Using logistic regression, we found dental status (edentulous), community of residence (Sudbury), income (up to \$20,000) and dental insurance coverage (none) were important factors in not making a dental visit in the last year. These same factors, plus education (elementary) were important where subjects reported visiting a dentist or denturist only when there was pain or trouble.

SOMMAIRE

Les personnes âgées ont moins tendance à demander des soins dentaires que les personnes des groupes plus je-

unes. Bien que le taux des demandes ait augmenté chez les gens âgés, le taux des demandes de la part des édentés est si bas qu'il fait baisser la moyenne générale du groupe. Nous avons utilisé les données de l'étude faite en Ontario sur la santé bucco-dentaire des gens âgés afin de déterminer les variations dans les demandes aux quatre endroits choisis pour les fins de l'étude: Toronto, North York, le comté de Simcoe et la région de Sudbury. Nous avons téléphoné à 3 033 sujets dont 907 se sont soumis à des examens dentaires et à une interview personnelle.



Les 907 sujets avaient de 50 à 97 ans, 57 p. cent étaient des femmes et les deux tiers étaient nés au Canada. En tout, 60,5 p. cent avaient rendu visite à un dentiste ou à un denturologiste au cours de l'année précédente, mais ce pourcentage était beaucoup plus bas chez les édentés (17 p. cent) comparativement à celui des personnes ayant des dents (72 p. cent) (test χ^2 ; $p < .0001$). Sur les 357 sujets qui n'avaient pas visité le dentiste au cours de l'année précédente, presque la moitié (48 p. cent) ont déclaré qu'ils n'avaient pas eu de malaises et 20 p. cent ont dit qu'ils n'en avaient pas les moyens. Parmi les édentés, 94 p. cent ont déclaré qu'ils visitaient le dentiste seulement en cas de problème ou de douleur, alors que chez les personnes avec des dents ce pourcentage est seulement de 26 p. cent (test χ^2 ; $p < .0001$). En procédant par

régression logistique, nous avons découvert que le fait d'être édenté, le lieu de résidence (Sudbury), le revenu (jusqu'à 20 000\$) et le fait de ne pas avoir d'assurance dentaire sont tous des facteurs importants pour expliquer que certaines personnes âgées ne sont pas allées chez le dentiste l'an dernier. Outre l'éducation (le primaire seulement), les mêmes facteurs prévalent lorsqu'il s'agit d'expliquer que certaines visitent le dentiste seulement quand il y a de la douleur ou un problème.

Introduction

Given the aging of the population and the prediction that the need and demand for dental care will rise among the elderly, there is a renewed interest in research on the utilization of dental services. Studies indicate that the percentage of people who have visited a dentist in the previous year has increased over the past three decades, and this increase has been particularly marked among older adults. In the U.S., cross-sectional surveys conducted by the National Centre for Health Statistics between the late 1950s and the mid-1980s show that the percentage of persons aged 65 years and over who visited a dentist has doubled since 1957.^{1,2} Comparable data for Canada are lacking. However, a CDA poll conducted in 1988 showed that between 1985 and 1988 there was a nine per cent increase in the proportion of adults aged 18 years and over who reported a dental visit in the previous year. Among people aged 50 years and over the increase was 16.4 per cent — from 42.2 per cent in 1985 to 49.1 per cent in 1988.³

Nevertheless, the elderly tend to use dental services less than younger age groups, with the exception of children under the age of six.⁴ This is largely due to the fact that a relatively high proportion of the elderly are edentulous individuals whose very low utilization rates depress the overall rates for the group. When these rates are compared for dentate persons only, however, age differ-

ences disappear. For example, the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986,⁵ found that dentate seniors reported a pattern of visits for dental care very similar to that found for younger age groups; i.e. 59 per cent of the employed sample had seen a dentist within the last 12 months compared to 55 per cent of the dentate seniors. In fact, the increase in the use of dental services by older adults is partly a function of declining rates of edentulism in this group.

On the basis of recent evidence, Gilbert et al⁶ have concluded that age is not a major factor influencing the use of dental care when populations are stratified by dental status. Moreover, older adults per se are no longer at unusually high risk of inadequate levels of dental care and do not warrant increased research attention. Rather, the aim should be to identify sub-groups who are at high risk, such as low income groups, those with low levels of education or those without dental insurance coverage, to understand the factors influencing their use and non-use of dental care and to increase their access to regular preventive and maintenance services. Summary statistics of dental utilization, while seemingly favorable, may mask substantial differences between such population sub-groups.

In this paper, we use data from the Ontario Study of the Oral Health of Older Adults to explore the use of dental services by adults aged 50 years and over. Our intent is to describe the oral health and treatment needs of the current (aged 65 years and over) and future (aged 50 to 64 years) elderly living independently in two metropolitan and two non-metropolitan communities in Ontario. The study sites were the cities of Toronto and North York, Simcoe County, and Sudbury and District. In previous papers, we have presented data on oral health status and treatment needs, and the way these vary by age, community of residence and income.^{7,8} These data show that older individuals, those living in the non-metropolitan communities, and low-income groups had worse oral health and higher needs for dental treatment. Our aim here is not to develop an explanatory model of dental utilization, but to identify variations in the use of dental services across the four study sites by subjects in the target age range.

Materials and Methods

Independently-living persons aged 50 years and over were identified by means of a telephone survey based on random digit dialing. They were invited to participate in a detailed personal in-

Table I

Socio-Demographic and General Health Characteristics of Study Subjects (%)

Age:	50-64 years	58.5
	65-74 years	29.5
	75 years and over	12.0
Female		57.1
Born in Canada		64.7
Married		52.3
Employed		42.9
Income < \$20,000 per annum		38.1
Education beyond high school		36.7
One or more chronic medical conditions		62.1
One or more limitations in ADL*		22.2
*Activities of daily living		

Table II

Time Since Last Dental Visit (%)

Time since last visit	Dentate n=709	Edentulous 94	All n=903
Within the last year	72.4	17.0	60.5
1-2 years	11.3	9.8	11.0
3-5 years	10.6	30.4	14.8
6 or more years	5.8	42.8	13.7
Differences between the dentate and edentulous statistically significant: $p < .0001$			

Table III

Main Reason for Not Visiting Given by Those Without a Dental Visit in the Previous Year (%) N = 357

Nothing was wrong	47.6
Could not afford cost	20.4
Afraid of dental procedures	5.5
Too busy	3.9
General health problems	2.9
Dental office inaccessible	2.6
Problems not serious enough	2.3
Did not want to spend the money	1.6
Other	10.7
Don't know	2.5
Total	100.0

terview and comprehensive clinical examination. The precise methods used are described more fully in our earlier papers.^{7,8}

Data on the utilization of dental services were obtained by telephone and personal interviews, along with appropriate data on socio-demographic char-

TABLE IV:**Reasons for and Regularity of Dental Visits (%)**

	Dentate	Edentulous	All
At least once a year for a dental examination	67.7	3.7	54.0
From time to time for a dental examination	6.7	2.1	5.7
Only when having pain or other trouble	25.6	94.2	40.2
Differences between dentate and edentulous statistically significant: $p < .0001$			

TABLE V:**Reasons for the Last Visit Given by Those with a Dental Visit in the Previous Year (%)**

	Dentate	Edentulous	All
	n=504	n=33	n=537
Went myself for check-up/cleaning	52.4	9.1	49.2
Called in by dentist/denturist for check-up	8.2	2.3	7.8
Something was hurting, bothering me	19.2	18.2	19.2
To get a denture/filling fixed	13.4	68.2	17.5
Part of course of treatment	4.8	2.3	4.6
Other	2.0	0	2.0
Differences between dentate and edentulous statistically significant: $p < 0.0001$			

acteristics and other variables likely to be associated with service use, such as dental insurance coverage.

Two measures of utilization were employed. The first – time since the last dental visit – is the measure most commonly used in studies of dental care utilization. It is usually reported as the percentage of persons visiting a dentist in the previous 12 months. Although a common measure, it has a number of important limitations. First, it does not identify the reasons behind or the pattern of dental visiting. Second, it includes an unknown proportion of people who use dental services sporadically – or only when having pain or other problems – who happened to have seen a dentist or other dental care provider in the 12 months prior to the interview. Consequently, this measure is likely to over-estimate the proportion of the population seeking regular dental care. In order to overcome these limitations, subjects were asked if they saw a dentist or denture therapist: a) at least once a

year for a dental examination; b) from time to time for a dental examination; or, c) only when experiencing pain or other trouble. The aim underlying this variable was to more accurately identify those individuals who were receiving regular preventive and maintenance services.

In assessing variations in dental utilization, dental status (dentate/edentulous), community of residence, age, gender, household income, educational status and insurance coverage were the predictor variables. These variables were chosen as the most likely to differentiate users and non-users of dental care.⁴

Results

Characteristics of subjects

Telephone interviews were completed by 3,033 individuals and the personal interview and clinical examination by 907 individuals. Unless otherwise

stated, the analyses reported below are based on data from the personal interviews, since more extensive data on dental utilization were collected during this phase of the study.

The socio-demographic characteristics of the 907 subjects are shown in Table I. Fifty-five per cent were female and ranged from 50 to 97 years of age, with a mean age of 63 years. Two-thirds were born in Canada, two-fifths were employed and two-fifths lived in households with annual incomes of less than \$20,000. Just over 60 per cent reported one or more chronic medical conditions and just over 20 per cent reported difficulty performing one or more activities of daily living. The majority (78.1 per cent) were dentate and 46.3 per cent had dental insurance coverage that paid for all or part of their dental care.

Utilization of dental services by dental status

Overall, 81.9 per cent of subjects reported visiting their regular dentist or denturist when they required dental treatment or advice. There were significant differences between the dentate and edentulous subjects in the proportion reporting a regular source of care (90.4 per cent versus 53.4 per cent: $p < .0001$).

A dentist or denturist was seen by 60.5 per cent of subjects in the previous year. Conversely, 13.7 per cent had not seen a dental care provider in six years or more. There were marked differences between the dentate and the edentulous subjects as to the amount of time that had elapsed since their last dental visit (Table II). Almost three-quarters of the dentate had made such a visit in the 12 months prior to the interview, compared with less than two-fifths of the edentulous ($p < .0001$). Just over 40 per cent of the edentulous reported not having seen a dental care provider in six years or more.

The main reasons given by those who had not seen a dental care provider in the previous year were that "nothing was wrong" (47.6 per cent), and cost (20.4 per cent) (Table III). Relatively small proportions of these subjects gave reasons such as fear of dental procedures, general health problems or the inaccessibility of dental services. The dentate were more likely to cite cost as the reason for not visiting in the previous year (24 per cent versus 16 per cent), while the edentulous were more likely to cite a lack of perceived need (53.8 per cent versus 38.2 per cent).

Among subjects as a whole, 54 per



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cent reported that they visited a dentist or denturist at least once a year for a dental examination and 40.2 per cent reported visiting only when having pain or other trouble. **Table IV** shows that there were also marked differences between the dentate and the edentulous in their pattern of use of dental services. Two-thirds of the dentate reported that they visited a dentist at least once a year for a dental examination, while less than one in 20 of the edentulous made such visits. The overwhelming majority of the edentulous (94.2 per cent) sought oral health care only when experiencing pain or other problems. This trend is also reflected in the reasons subjects who had seen a dental care provider in the previous 12 months gave for making their last dental visit (**Table V**). The majority of the dentate went for check-ups, while most of the edentulous visited because of pain or problems with dentures.

Dental utilization by other predictor variables

Tables VI and VII show the association between the two measures of utilization and the six independent variables for all subjects and for dentate subjects. Analyses were not undertaken for the edentulous because small numbers in some of the categories meant that the observed percentages were unstable.

There were no significant differences by gender or age in the proportion of individuals reporting a visit to a dentist or denturist in the previous year or the proportion reporting going to a dental care provider at least once a year for an examination. However, there were significant differences by study site, household income, education and insurance coverage — both for subjects as a whole and for the dentate. Subjects living in Sudbury, those with low incomes, those who had less than a high school education and those without dental insurance coverage were less likely to report a visit in the previous year and less likely to report visiting a dental care provider at least once a year for a dental examination.

Since the variables associated with dental utilization show patterns of association, i.e. those with low incomes and the lowest level of educational attainment are the least likely to have dental insurance, logistic regression analyses were used to determine whether these variables had significant independent effects and to assess the magnitude of their effects on dental utilization. Dental status was entered into the regression

models as a control variable. The results are summarized in **Table VIII**.

Living in Sudbury as opposed to the other study sites, having an annual household income of less than \$20,000 and not having dental insurance coverage were significantly associated with the probability of not visiting a dental care provider in the previous year. The associated odds ratios for these variables were 2.65, 1.91 and 1.69 respectively. Educational status had no effect when controlling for these other variables.

Table VIII also shows that living in Sudbury, having only an elementary education, having an income of less

than \$20,000 and not having dental insurance coverage were significantly associated with the probability of only visiting a dental care provider when having pain or other problems. Odds ratios were 2.57, 2.40, 2.29 and 1.53 respectively.

These analyses suggest that community of residence is the best predictor of dental utilization after controlling for other important variables.

The combined effects of these variables was assessed by comparing the utilization rates of low income subjects living in Sudbury (the community with the lowest utilization rates) with high income subjects living in North York

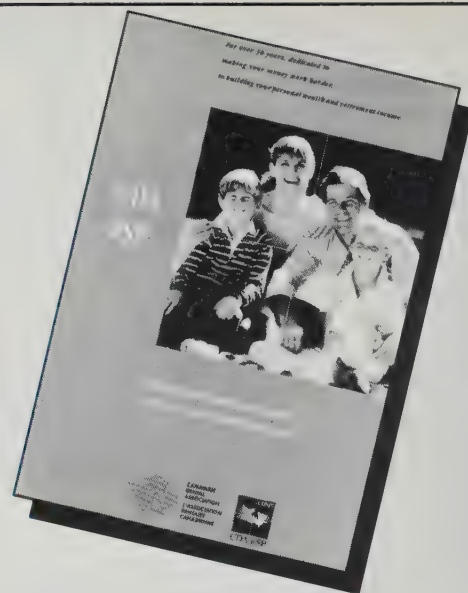
Table VI

Per Cent Reporting a Dental Visit in the Previous Year by Predictor Variables

	n	All Subjects	n	Dentate Subjects
Gender:				
Male	385	61.0	309	72.2
Female	515	60.0	398	72.4
Age:				
50-64 years	529	62.8	439	72.0
65-74 years	267	53.3	196	72.4
75 years & over	107	57.0	74	74.3
Community:				
Toronto	253	63.2***	202	75.7***
North York	303	71.0	260	78.1
Simcoe	164	60.4	130	71.5
Sudbury	183	39.3	117	54.7
Income:				
< \$20,000	272	43.8***	177	60.5***
\$20-39,000	220	62.3	182	70.9
\$40-59,000	120	73.3	105	80.0
\$60,000 and over	102	88.2	97	92.8
Education:				
Elementary	141	35.5***	80	57.6***
High School	426	56.3	320	67.8
College/University	329	76.0	302	80.8
Dental Insurance:				
All	153	71.9**	131	79.4*
Part	265	67.9	222	77.5
None	672	53.8	351	67.0

*p < .05; **p < .01; ***p < .0001: Chi-square test

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(the community with the highest utilization rates). Among the former, 53.8 per cent of the dentate reported a dental visit in the previous year and 51.3 per cent reported visiting a dental office at least once a year for a dental examination. Among the latter, the rates for dentate subjects were 97.8 per cent and 93.3 per cent, respectively.

Association between the utilization variables

While there was a significant association between the two measures of utilization ($p < .0001$), only 82.1 per cent of those reporting a visit to a dental care provider in the previous year also reported that they visited regularly for a dental examination. The discrepancy was even more marked for those with low overall utilization rates. For example, in the highest income group, only 5.6 per cent of those reporting a dental visit in the previous year also reported that they only visited when having pain or other trouble. The comparable figure for the low income group was 22.7 per cent. When the analysis was repeated for the dentate only, the percentages were 5.5 per cent and 16.8 per cent respectively.

Discussion

This study has revealed relatively high rates of utilization of dental services by adults aged 50 years and over living in four Ontario communities: 60.5 per cent of all subjects and 72.4 per cent of dentate subjects reported a dental visit in the previous year. These rates are higher than those reported for similar age groups across Canada as a whole³ and higher than those reported by a recent national study in the U.S.⁵ They confirm the trend toward the increasing use of dental services by older adults. That this is due to declining rates of edentulism is supported by the observed major differences in the utilization of dental services by dentate and edentulous individuals in this study.

However, the main finding of this study is that while overall rates are favorable, the summary measures used mask considerable variations across population sub-groups. There were significant differences in utilization rates according to community of residence, household income, education and dental insurance coverage among dentate persons. In fact, the utilization rates of high income subjects living in North York were almost double those of low income subjects living in Sudbury. Yet analyses of other data from the study have shown that those with low incomes and those

living in Sudbury have worse oral health than high income subjects and those living in southern urban communities. This is, perhaps, an example of what has been termed the "inverse care law":⁹ those most in need receive the fewest services. Clearly, addressing these inequities in oral health care should be regarded as a priority by the dental health care professions and health policy makers. One example of a coordinated strategy can be found in Toronto's geriatric dental program, which included a city-wide dental health promotion campaign, a mobile program for institutionalized seniors and community clinics for low income seniors living inde-

pendently in the community.¹⁰ Similar initiatives need to be considered in non-metropolitan communities that have higher levels of need and lower levels of utilization.

However, these data also suggest that cost is not the only barrier to oral health care for older adults, as just over half of the dentate subjects in the lowest income group reported receiving regular dental care. This does not mean that cost is not an issue; resources directed toward dental care may mean that low income groups may have to forego other goods and services. It does mean that other barriers to dental services faced by those at high risk of receiving inade-

Table VII

Per Cent Reporting Visiting at Least Once A Year For a Dental Examination

	n	All Subjects	n	Dentate Subjects
Gender:				
Male	382	53.9	306	66.6
Female	507	54.2	394	68.8
Age:				
50-64 years	526	57.2	438	68.3
65-74 years	262	48.9	192	64.6
75 years & over	104	51.0	72	72.2
Community:				
Toronto	250	59.6***	201	72.2***
North York	295	67.5	254	77.2
Simcoe	164	43.3	130	54.6
Sudbury	183	34.4	117	53.0
Income:				
< \$20,000	266	36.5**	173	53.2**
\$20-39,000	219	56.6	181	68.5
\$40-59,000	120	65.8	105	74.3
\$60,000 and over	102	85.3	97	89.7
Education:				
Elementary	139	27.3**	79	48.1**
High School	420	47.6	316	62.3
College/University	326	73.0	300	78.0
Dental Insurance:				
All	151	68.9**	131	77.9
Part	265	61.1	222	73.0
None	463	46.2	344	60.8

* $p < .05$; ** $p < .01$; *** $p < .0001$: Chi-square test

Table VIII

Results of Logistic Regression Analysis

Dependent variable	Probability of NOT having a dental visit in the previous year		
Independent variable:	B	p	OR
Edentulous	2.3214	.0001	10.19
Resident in Sudbury	0.9733	.0001	2.65
Income < \$20,000	0.6460	.001	1.91
No insurance coverage	0.1906	.01	1.69
Elementary education	0.4557	NS	—
Constant	-1.7613	.0001	—

Dependent variable	Probability of visiting only when having pain or other trouble		
Independent variable:	B	p	OR
Edentulous	3.5260	.0001	33.98
Resident in Sudbury	0.9467	.0001	2.57
Elementary education	0.8761	.001	2.40
Income < \$20,000	0.8279	.0001	2.29
No insurance coverage	0.4286	.05	1.53
Constant	-1.937	.0001	—

quate levels of dental care need to be identified and addressed. Certainly, studies of the utilization of dental services by older adults should focus on disadvantaged groups, rather than older adults as a whole, and attempt to identify relevant differences between those who do and do not use dental services.

A model to guide such studies has recently been described by Stewart,¹¹ who drew a distinction between access to and use of health services. The former refers to a population group's potential entry to the health care system, while the latter refers to realized access. Access has three components: financial, spatiotemporal and psychosocial. This first component refers to the costs of care, the second to the time and location in which services are delivered, and the third to attitudes, values and beliefs about health and health care.

Even where financial barriers to health care are removed, multiple other barriers may persist to reduce the use of services by those in need. Poverty, for example, involves characteristics other than the lack of financial resources that prevent the utilization of dental care consistent with oral health needs. Identifying these barriers by the study of disadvantaged groups is a necessary first step in developing strategies to remove them. It may also be the case that

some of these barriers explain the significant geographical differences in the use of dental services. In this regard, studies need to focus on the characteristics of communities as well as the characteristics of individuals.

Another point to emerge from the study is that conventional measures of utilization have important limitations. The most common — time elapsed since last dental visit — is an ad hoc measure in that it does not reflect either theoretical concerns or policy goals. If our aim is to ensure that all Canadians receive regular preventive, maintenance and treatment services appropriate to their needs, then measures of utilization compatible with that aim need to be developed. The second measure used in this study, in attempting to capture both the reasons for and the regularity of dental care, is merely a first step in this direction. However, a comparison of both approaches does suggest that reporting the percentage of the population who have had a dental visit in the previous 12 months does tend to over-estimate the volume and nature of care received, particularly by disadvantaged groups. Consequently, summary statistics using simple measures of utilization, although seemingly favorable, need to be interpreted with caution and should not give rise to complacency.

While dental utilization is increasing, this may lead to a widening of the gap between advantaged and disadvantaged groups. It is certainly the case that as levels of health have improved overall, the discrepancy between the rich and the poor has widened.

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Dr. Hamilton is the director of dental services for the Sudbury and District and Algoma Health Units.

Reprint requests to **Dr. Locker**.

References

1. National Center for Health Statistics. Dental care: interval and frequency of visits, United States, July 1957 - June 1959. Health Statistics from the National Health Interview Survey, Series B, No. 14, Public Health Services Publication No. 584-B14, Washington, DC, March 1960.
2. Jack, S. and Bloom, B. National Center for Health Statistics. Use of dental services and dental health: United States, 1986. Vital and Health Statistics, Series 10, No. 165, DHSS Publication No. (PHS) 88-1593, Public Health Service, Washington, DC, 1988.
3. Canadian Dental Association. Highlights of the CDA's 1988 Gallop Poll: Canadians are getting the message — and acting upon it. *J Can Dent Assoc* 55:241-243, 1989.
4. Kiyak, H.A. Reducing barriers to older persons' use of dental services. *Int Dent J* 39:95-102, 1989.
5. National Institute of Dental Research. Oral Health of United States Adults: The National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986. DHSS, Public Health Service, NIH Publication No. 87-2868, Washington, 1987.
6. Gilbert, G.H., Branch, L.G. and Orav, E.J. Predictors of older adults' longitudinal dental care use: ten year results. *Med Care* 28: 1990.
7. Locker, D., Leake, J.L., Hamilton, M. et al. The oral health status of older adults in four Ontario communities. In press.
8. Locker, D. and Leake, J.L. Income inequities in oral health among older adults in four Ontario communities. In press.
9. Hart, J.T. In the inverse care law. *Lancet* 27:405-412, 1971.
10. Lee, J. The City of Toronto's geriatric dental program. *J Can Dent Assoc* 56:877-878, 1990.
11. Stewart, M.J. Access to health care for economically disadvantaged Canadians. *Can J Publ Health* 81:450-455, 1990.

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March 8-12: The 15th Asian Pacific Dental Congress
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March 26-28: World Congress XII for Oral Implantology
 in Sydney, Australia. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

March 28-April 4: 29th International Alpine Dental Conference
 in Courchevel 1850, France. Contact: The International Dental Foundation, 53 Sloane St, London, SW1X 9SW, England.

April/Avril 1992

April 6-11: 25th International Dental Show
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April 8-12: XI International Conference on Oral and Maxillofacial Surgery
 in Buenos Aires, Argentina. For information and registration, contact the Secretariat at the following address; XI ICOMS, Casilla de Correo 4437, 1000 Correo Central, Argentina.

April 29-May 3: 8th Annual Scientific Sessions of the American Academy of Cosmetic Dentistry
 in Palm Springs, Calif. For more information, contact: Barbara Jo Zoelle, The American Academy of Cosmetic Dentistry, 2711 Marshall Ct, Madison WI 53705. Tel: (608) 238-6529.

November/Novembre 1991

November 30-December 5: Greater New York Dental Meeting
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January 11-12: ACOI Winter Seminar: Live Implant Surgery Utilizing Blades
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January 25-February 1: 28th International Alpine Dental Conference
 in Courchevel 1850, France. Contact: The International Dental Foundation, 53 Sloane St, London, SW1X 9SW, England.

January 29-February 1: Miami Winter Meeting 1992
A Journey to Synergy at the Hyatt Regency Miami. For further information, call (305) 667-3647 or (305) 944-5668.

February/Février 1992

February 8-15: Barbados Dental Association Convention.
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February 10-15: Mid Winter Dental Convention and Maxillofacial Surgical Symposium,
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February 15-22: Dalhousie Ski Seminar
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February 16-19: 127th Annual Midwinter Meeting of the Chicago Dental Society.
 Contact: Chicago Dental Society, 401 N. Michigan Ave, Suite 300, Chicago, IL 60611-4205, USA. Tel: (312) 836-7300. Fax: (312) 836-7337.

February 22-29: Virgin Islands Dental Association Convention.
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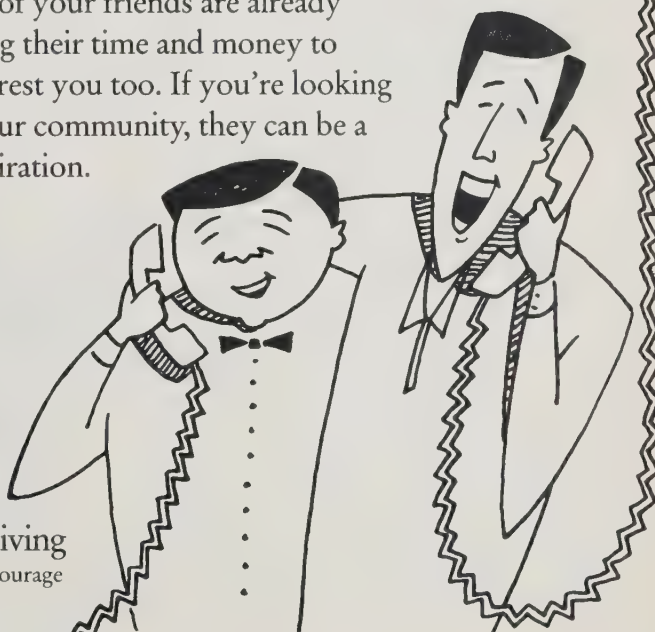
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MCGILL'S FACULTY OF DENTISTRY MUST BE SAVED

A crushing blow was dealt to the dental profession in Canada July 17, when McGill University announced that it was considering a recommendation to close its faculty of dentistry in the spring of 1995.

Founded in 1903, the McGill faculty of dentistry is one of the oldest and most prestigious dental schools in Canada. Its loss would strike deep at the heart of the dental profession, setting a precedent that would effectively place control of community dental health in the hands of the universities.

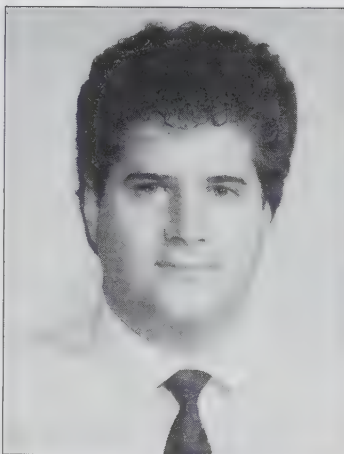
The administration structure in place today at most Canadian universities is little more than a microcosm of government. Given this situation, we believe that the closure of McGill's dental faculty would, in effect, begin a process that would see organized dentistry lose control over the future of our profession. How can we expect provincial legislators to respect our obligation to maintain high standards of dental health care when McGill's administration has shown little or no concern for the impact the closure of its dental faculty will have on Quebec society.

And the closure will be felt, especially in Quebec's anglophone and the allophone (people whose mother tongue is neither English or French) communities. The province has sizable Italian, Greek, Jewish, Chinese, and Iranian communities, among others. Many of these groups speak English as a second language, with varying degrees of fluency.

In an ideal world, allophones would be able to receive dental treatment in their native language. But this is not always possible, and many allophones seek out English-speaking dentists instead.

If McGill's faculty of dentistry closes, however, the number of English-speaking dentists practising in Quebec is almost sure to decline, given that English-speaking dental students from Quebec would then have to earn their degrees in French or go to the United States to study. It would be extremely difficult for these students to get accepted into a Canadian dental faculty located outside of Quebec, given current enrolment policies.

Today, because of the limited number of places available, most dental schools will only consider students who are residents of the province where the school is located. Almost all of the students attending the Univer-



Tom Rougas

sity of Manitoba's dental college, for example, are Manitoba residents.

Another argument put forward by McGill to justify its position is that there are already too many dentists in Canada. But the need for dental manpower in Canada will increase in the future.¹ This will occur in response to growing needs, which will amount to millions of hours over the next two decades. Furthermore, the closure of a faculty of dentistry in this country is folly when there are already 300 Canadians studying dentistry in the United States. Clearly, the demand for dental services and dental education is there.

It should be further noted that McGill's excellence is also derived from its part-time staff, whose input both to the faculty and to the community at large results in high standards of excellence in dental care.

Fortunately, the proposal to close McGill's dental faculty must still undergo due process before it can be ratified. The university has given us only a short time (committees began looking at the closure proposal's implications September 24) to present our case, however. This is an apparent effort to expedite the demise of the faculty.

The greatest and most convincing weapon we can use to win our battle against the faculty's closure is support from the general community, and particularly from national and international members of our profession. If you are interested in making your views known, please send a letter voicing your support for our cause to: Principal David Johnston, McGill University, 845 Sherbrooke St., James Administration Building, Room 506, Montreal, Quebec H3A 2T5.

We are confident that the overwhelming support already shown by the community, combined with the additional support we hope to secure in the coming months, will be enough to stop the closure process from continuing. But we need your help, and we need it now.

Tom Rougas

President of the McGill Dental Students' Society

I. Douglass, C. W. and Gammon, M.D.

The future need for dental treatment in Canada. J. Can. Dent. Assoc. 51(8): 583-590, 1985

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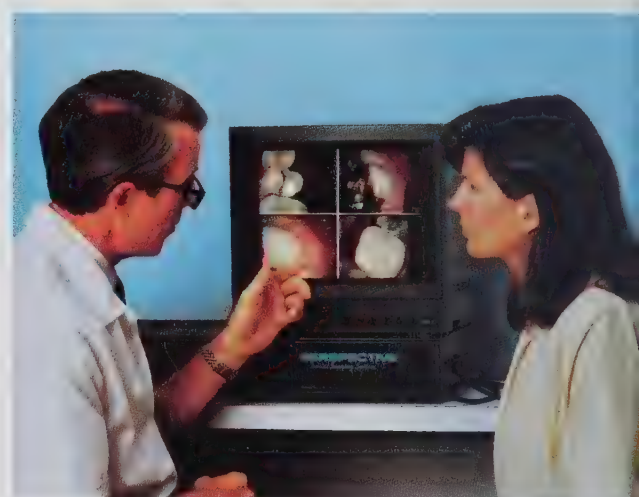
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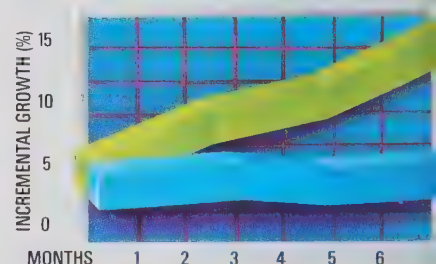
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Cover:

The staff and management committee
of CDA extend holiday greetings to our
members and friends.

(PHOTOGRAPH BY TEAL PHOTOGRAPHIC
SPECIALISTS)

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JOURNAL



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"60 MINUTES – A YEAR LATER"

On December 16, 1990, during its prime-time television news program, "60 Minutes," CBS broadcast a story on the hazards of mercury toxicity in dental amalgam. That story, seen by 20 million people across North America, created a dental health controversy that can only be compared to the amalgam wars waged by the Crawcour brothers in the mid-nineteenth century.

Fortunately, the furore was short-lived. Dentistry responded to the "60 Minutes" exposé in a fair, objective manner, and the public was reassured. We moved on to tackle other concerns.

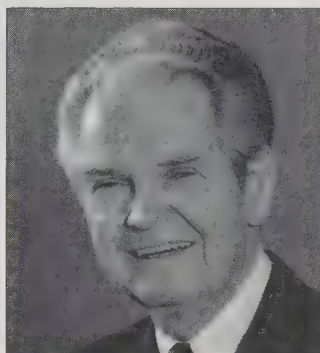
But a story that ran in the October 21, 1991, *Globe and Mail* led us to review the entire "mercury" debate, and what it has meant to dentistry over the past 12 months.

According to the *Globe and Mail*, "60 Minutes" is planning to broadcast a story on the use of monosodium glutamate (MSG). (By the time this editorial is published, CBS's so-called "investigation" of MSG may have already aired.) We can only hope that CBS is more fair to the food industry than it was to organized dentistry. But several *Globe and Mail* references to the CBS style of reporting – "yelling fire in a crowded theatre and ambush journalism" – seem to indicate that there isn't much hope for MSG.

Despite CBS's unbalanced reporting on mercury, the dental community has fared well over the past year – mainly because we did not lose our scientific perspective. Today, as we have in the past and will in the future, we base patient care decisions on reliable research and scientific evidence. A true profession has no other choice.

Both the U.S. Food and Drug Administration (in March) and the National Institute of Health (in August) heard evidence from learned scientists from around the world, and both concluded that there is no reason for anyone to avoid having an amalgam filling if their dentist recommends it. It would be difficult, and surely unwise, not to give credence to these conclusions.

Three prominent researchers, Dr. Sheldon Newman of Colorado (formerly of Alberta), Dr. Irwin Mandel of Columbia University and Dr. J. Rodway Mackert of the Medical College of Georgia, each reported, in an American Dental Association publica-



Dr. Ralph Crawford

tion, that the proper handling of amalgam poses no hazards. Surely we cannot believe that these eminent scientists were trying to fool us.

Recently, two of the world's most renowned clinical investigators, Dr. Gordon Christensen and Dr. Ronald Jordan, have informed audiences that amalgam remains a reliable material. Can we seriously think that they are both wrong?

Similarly, within the pages of this month's *Journal*, Dr. Michael MacEntee and Dr. Phillippe Mojon of the University of British Columbia

present an excellent review of the biological effects of the mercury released from amalgam restorations. They conclude: "We found no compelling evidence that amalgam restorations pose an unusual risk to the health of the population."

One overriding tenet in each of the above statements on the safety of amalgam was a recommendation for further study, research and investigation. This common call for further research bestows credibility on our profession. It is precisely why dentists did not panic nor the public lose faith. It is a dependence on the logic of science.

Dr. Derek Jones, of Dalhousie University, summed up dentistry's position well in the April '91 issue of the *Journal* (57:291-293, 1991), when he said: "The simple conclusion is that science has to progress in a logical manner by peer review. This calls for a mature and responsible approach from the scientific community. Science is self-correcting, however; we must allow it to proceed in an appropriate manner."

The proof is in the pudding. One year after an unfair, staged, media presentation caused such an uproar, the dental profession is still in business. Our patients still trust us. They know that, should the day arrive when science, proceeding in an appropriate manner, indicates that mercury amalgam is unsafe, they will be the first to know. We will tell them the facts. A true profession cannot afford to proceed in any other fashion.

P. Ralph Crawford, BA, DMD

Editor, *Journal of the Canadian Dental Association*

“I see the results of
CDA’s Dental
Awareness Program
every day — more
motivated, better
informed patients.”

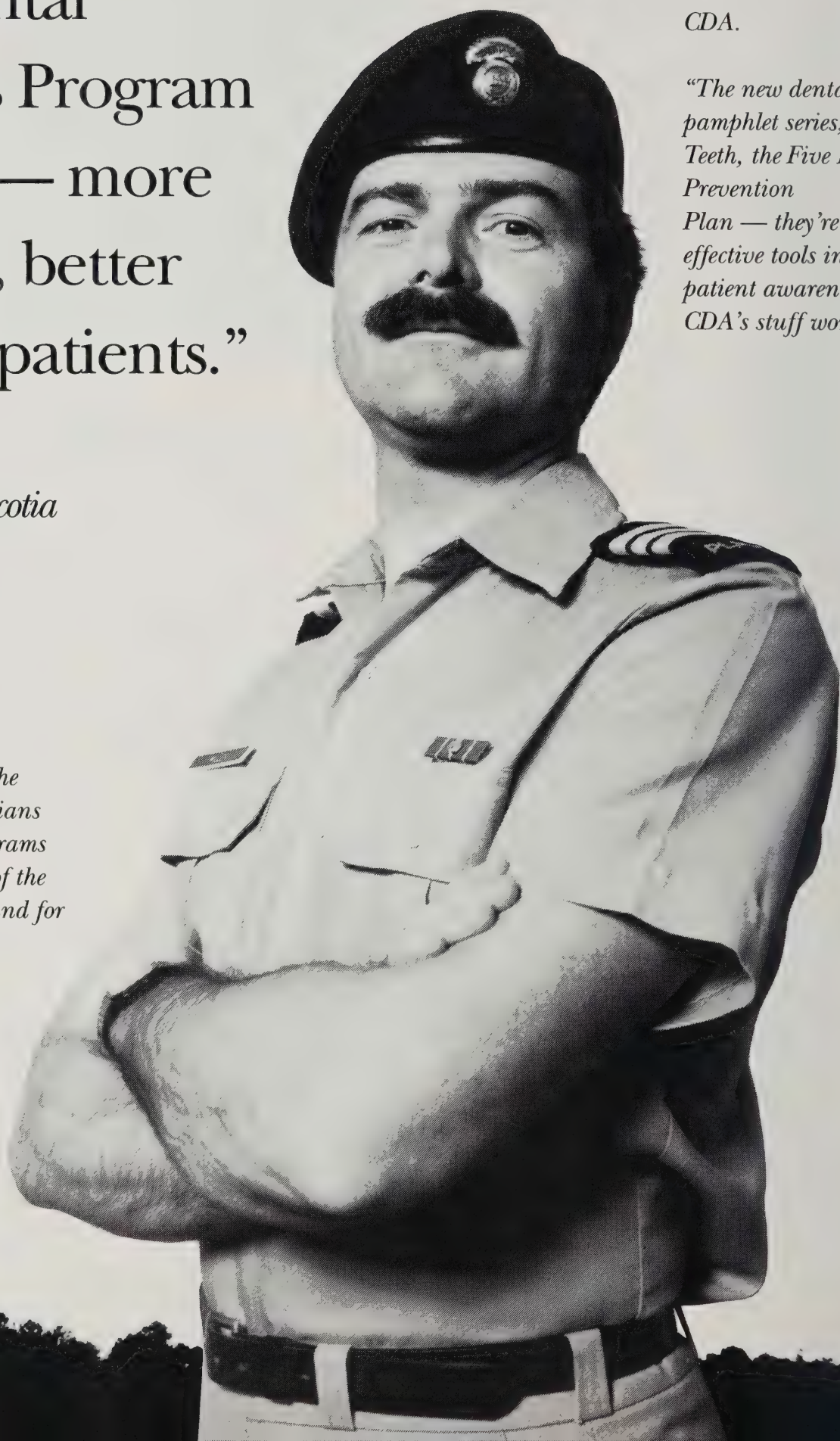
Dr. John Miller
Dartmouth, Nova Scotia



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ways CDA works for you, and for
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General practitioner,
army reserves officer
— and member of
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pamphlet series, First
Teeth, the Five Point
Prevention
Plan — they’re all
effective tools in
patient awareness.
CDA’s stuff works.”*



President's Column

CHEESE PLEASE!

It's that time of year again, the holiday season. A time of frenzied gift buying, sparkling decorations and office parties. A time for giving thanks, for looking back on who and what we are. And a time to be around family and friends.

Nothing can compare to the warmth and kindness you feel when you spend time with your family. When you know they are behind you, supporting you in all your endeavors. When you can sense their love and friendship.

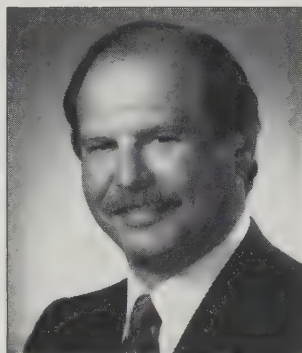
Whether you spend the holiday season with a special friend, your immediate family or with our large family here at CDA, it is a time for reflection, a time for assessing the year gone by. It is also a time to relax from the pressures of the working world, and a time for joy.

Unfortunately, the holiday season can also be a sad time for some. Through all the festivities, through all our joy and happiness, we can think of other people who are not as fortunate as we are. The people who have no money to buy food or shelter, the children in hospital, away from their parents, the lonely. For some, the holiday season is a time of terrible loneliness. A time when the lack of a family or friends seems unbearably painful.

As I gather with my family, and as you gather with yours, we should remember these people, and do what we can to help. It doesn't take much. Even the smallest gesture will be appreciated and welcomed.

The other people I especially remember at this time of year are the staff and volunteers at CDA, the people who, season after season, make it all happen for dentists from one side of the country to the other.

And this year, as I think back to the day when we all got together to pose for the pho-



Dr. Les Allen

tograph that appears on the cover of this month's *Journal*, I am more proud than ever of our CDA team. I know that 1991 was a difficult year for many of them, and I know that 1992 won't be any easier.

We did not get together at CDA headquarters last November just to be a part of a group photo session. In fact, the main reason the executive and senior staff got together was to reevaluate and reorganize some of our decisions, to make

adjustments and, yes, to tighten our belts.

As we look back on CDA in 1991, we see an extremely effective organization. We've been very successful with our programs, with our services to members. We've been on top of all the issues – the GST, mercury toxicity, HIV and infection control. Naturally, this has cost money. Money that was well spent for a good reason.

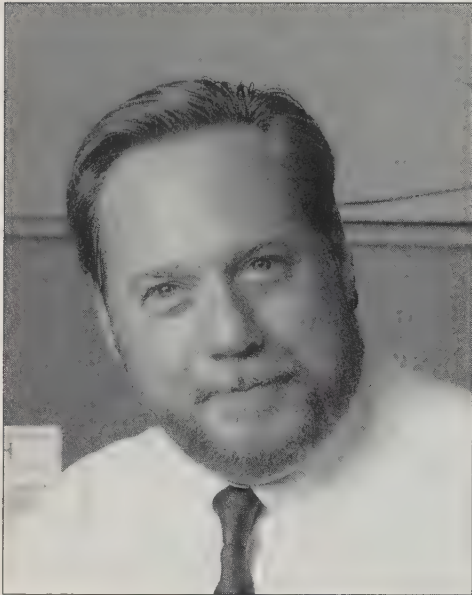
Still, we must assess and perhaps reassess what we do and why we do it. These are difficult times. Recessionary times. But we can still look to the future with high hopes. Take a moment to look at the *Journal's* cover once again. With these people behind us, how can we fail? We are a strong, vital organization with a promising future ahead of us. I am proud of what CDA stands for and thrilled to be a part of it.

Yes, the holiday season is a time for being together, cherishing all those special moments spent with family and friends. And so, from the management of CDA, and all the wonderful people who really make it happen, have a happy, healthy holiday season.

*Les Allen, B. Comm., DMD
President of the Canadian Dental Association*

News Update

Degussa's ReCap Program Benefits Environment and CFDE



Gary Jones
Degussa Canada Ltd.

The environment won't be the only winner if a new program to promote the safe disposal of scrap mercury amalgam is accepted by Canadian dentists.

In fact, Degussa Canada Ltd.'s ReCap program, initiated this fall, could turn into a "silver mine" for the Canadian Fund for Dental Education (CFDE). All of the proceeds generated by the program, which will see Degussa recycle and sell the scrap amalgam it collects from participating dental offices, will go to the fund.

"Degussa first introduced the scrap amalgam program in Germany about a year ago, and it is working well," said Mr. Gary Jones, the manager of Degussa's dental department. "If we estimate that 10,000 dentists in Canada use 10 capsules of amalgam a day for 200 days a year, then the potential exists for 20 million capsules to be thrown into landfills. Our ReCap program will allow dentists to help the environment and support a worthy cause at the same time."

Under the program, dentists who purchase 500 or more pre-capsulated Degussa amalgams will receive a ReCap kit. Each kit contains one storage jar for used caps, a smaller storage container for scrap amalgam and a pre-paid Federal Express mailing pack. The lid of the larger container is fitted with a special

material that absorbs excess mercury vapor, eliminating the need to add fluids such as X-ray solution to the jar.

When both containers are full, the dental office calls Federal Express on a toll-free line, and the scrap is delivered to Degussa. The company then recycles the amalgam and disposes of the caps in a manner consistent with Ministry of the Environment and Ministry of Transport guidelines.

All proceeds from the sale of the refined amalgam will be donated to CFDE. Since 1962, the fund has provided over \$3 million for the advancement of dentistry. These funds have been used to provide training fellowships, grants to dental schools, summer teaching programs and management institutes, student conferences, and financial support for dental students, research and dental awareness programs.

CDA/Dentsply Student Clinician Program Held In Quebec City

A Saskatchewan student claimed first place in the 21st CDA/Dentsply Student Clinician Program, held in conjunction with CDA's 1991 convention August 24-28 in Quebec City.

Mr. Paul Louie of the University of Saskatchewan was awarded first place for his table clinic on "Primer Contamination of Etched Enamel." Second place went to Ms. Vicky Ikonou of the University of Alberta for her presentation on "Glove Contamination of Polyvinylsiloxanes."

Mr. Louie's award included an invitation to be Dentsply Canada's guest at the American Dental Association convention, held in Seattle last October, while Ms. Ikonou received a cash award of \$500.

The annual awards program is sponsored by Dentsply Canada Ltd. through a special grant to the Canadian Fund for Dental Education.

One representative from each of Canada's 10 dental faculties – traditionally the winner of the student clinician program at his or her school – received an all expense-paid trip to Quebec City to present a table clinic.

ASGD Student Essay Contest

The American Society for Geriatric Dentistry (ASGD) is calling for submissions to its 11th Annual Student Essay Award Contests.



Participants and sponsors of the 21st CDA/Dentsply Student Clinician Program: Seated (l. to r.), Sylvie Jacques, Laval University; Dr. Gilles Dubé, CDA past president; Elana Peikoff, University of Manitoba; Mr. Burton C. Borgelt, chairman and chief executive officer of Dentsply International; and Vicky Ikonou, University of Alberta. Standing (l. to r.), Paul Louie, University of Saskatchewan; Robert Hawkins, University of Toronto; Sayed Mirbod, University of Western Ontario; Leslie H. Nip, University of British Columbia; Robert Clark, McGill University; Duncan F. MacIntyre, Dalhousie University; and Martin Bélanger, University of Montreal.

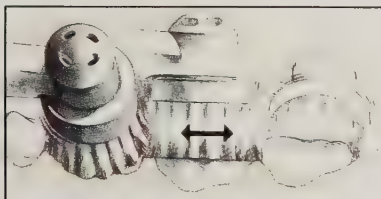
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Held by the society since 1981, the contests are just one of the many activities that ASGD has initiated to enhance the oral health care of the elderly.

Every dental or dental hygiene student enrolled in an accredited program in Canada or the United States is eligible to enter either of the contest's two sections – the Saul Kamen Scientific Report Award and the Arthur Elfenbaum Essay Award.

The Elfenbaum Award is given for the best referenced scholarly essay on a geriatric oral health care concept, policy or clinical issue. The Kamen Award is targeted primarily at graduate students and residents enrolled in advanced oral health-related programs, and is given to the author who best describes an original study that he or she has undertaken.

Both awards have a first prize of \$1,000 (U.S.), a second prize of \$500 and a third prize of \$100.

The contests close on March 1, 1992. Further information and contest rules may be obtained by contacting: Dr. Kenneth Shay, Chairman, Essay Award Committee, VA Medical Center, Milwaukee, WI 53295.

Canadian Academy of Endodontics Elects New President



Dr. Sharma Sinanan

Dr. Sharma Sinanan of Vancouver, B.C., became the 28th president of the Canadian Academy of Endodontics (CAE) last August, during the academy's 1991 annual meeting, held in Digby, Nova Scotia.

Dr. Sinanan received his dental degree from the University of British Co-

lumbia in 1972, and completed a graduate program in endodontics at the University of Oregon in 1980. He is now on the staff of the dental faculty at the University of British Columbia and a member of the Royal College of Dentists of Canada.

Smile – It Pays



Ms. Connie Barnwell (l.) receives the "Smile" contest grand prize from Ms. Barbara Wishart, the executive director of the New Brunswick Dental Society.

The New Brunswick Dental Society recently announced the winner of the "SMILE" contest – a joint initiative undertaken by the four Atlantic Provinces for Dental Awareness Week, 1991.

Ms. Connie Barnwell, of Fredericton, N.B., won the grand prize of a trip to New York.

Quebec Oral Surgeon New RCDC President

Dr. Guy Maranda of Ste-Foy, Quebec, has been installed as the new president of the Royal College of Dentists of Canada (RCDC).

Elected to the RCDC council for the first time in 1984, Dr. Maranda has been a fellow of the organization since 1972. His term as president will be for two years, until 1993.

Dr. Maranda earned his dental degree from the University of Montreal, and completed his graduate training at the University of Pennsylvania.

Dr. R. John McComb, an oral pathologist with the University of Toronto, will serve as RCDC's vice-president.



Dr. Guy Maranda, Ste-Foy, Quebec

CIDA Announces Professional Awards

Canadians who want to go past the other side of the mountain to see what's on the other side of the world should keep the Canadian Bureau for International Education in mind.

Through the Canadian International Development Agency (CIDA), the bureau sponsors two national award programs. As many as 25 awards of up to \$25,000 each are available to Canadians interested in pursuing a two- to six-month work/study project in a developing country, under the CIDA Professional Awards program, while the CIDA Awards for Canadians program is geared toward individuals seeking long-term training.

To be eligible for a CIDA Professional Award, a candidate must develop a work/study project that fulfils a practical, focused need within a host country, and demonstrate solid host country support for that project.

The preferred fields of specialization for projects fall into three main categories – human resources, private sector and environmental. Applications must be received by January 15, 1992, or April 30, 1992.

More information is available from: Kate Whidden, Manager, CIDA Professional Awards, Canadian Bureau for International Education, 1400 – 85 Albert Street, Ottawa, Ontario K1P 6A4. Tel. 613-237-4820.

New CFDE Chairman Elected

Dr. Gordon W. Thompson of Edmonton was elected chairman of the Cana-

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6. Kenneth Shay – “Guidelines for Restoring the Aged Dentition”	08/26 (am)	_____	\$20.00
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11. Gérard Bouger – “Le marketing au service du cabinet dentaire”	08/26	_____	\$20.00
12. Barbara Steinberg – “Dental Considerations for the Female Patient”	08/26	_____	\$20.00
13. Sebastien Ciano – “Perio-chemotherapeutics”	08/27 (am)	_____	\$20.00
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15. Barbara Steinberg – “A Team Approach to Treating the Dental Patient with Medical Problems”	08/27	_____	\$20.00
16. Dennis Smith – “Update on Bonding and Cements”	08/27	_____	\$20.00
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18. Sebastien Ciano – “Dento-therapeutics”	08/27 (pm)	_____	\$20.00
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Pour commander la *vidéocassette* du cours pratique du Dr Torsten Jemt en anglais, prière d'envoyer un chèque de 40 \$ à l'attention de **Janice Edgar, Service des congrès, 1815 promenade Alta Vista, Ottawa, Ontario, K1G 3Y6**

dian Fund for Dental Education (CFDE) during CDA's 1991 annual convention, held in Quebec City last August.

Currently the dean of the faculty of dentistry at the University of Alberta and the acting chairman of the department of dental health care, Dr. Thompson has been a member of the CFDE board of trustees since 1986. He replaces Dr. Ted Ramage of Vancouver, who served for six years as a trustee of CFDE, the latter three as its chairman.

At the same meeting, Dr. François M. Bourassa of Regina, Saskatchewan, became CFDE's newest trustee, representing the provinces of Saskatchewan and Manitoba. He replaces Dr. David Singer, also of Saskatoon, who has assumed the role of CFDE dental education representative on the CDA board.

Erratum

The *Journal* apologizes to Dr. William Thompson of Trenton, Ontario, for not recognizing him as one of the Canadians who have been awarded honorary membership in the American Dental Association (ADA). (His name was not included in the list of past honorees that appeared in an October 1991 News Update story, "CDA Executive Director Honored by ADA.")



Dr. William Thompson

The story was based on information supplied to the *Journal* by ADA, which included a list of past Canadian winners. Dr. Thompson's name was inadvertently omitted from that list.

Dr. Thompson received honorary membership in ADA in 1985. A past-president of the Canadian Dental Association and the former director general of the Canadian Forces Dental Services, he is currently the treasurer of the Fédération Dentaire Internationale (FDI).

Obituaries

Dover, W.R.: Dr. Dover graduated from the University of Toronto's dental faculty in 1953. He practised dentistry in Toronto. He died June 10, 1991.

Dowd, T.P.: Dr. Dowd graduated from Dalhousie University's dental faculty in 1940. He practised dentistry in Moncton, New Brunswick, and was a life member of CDA.

Finkbeiner, G.L.: Dr. Finkbeiner graduated from the University of Toronto's dental faculty in 1936. He practised dentistry in London, Ontario, and was a life member of CDA. He died August 16, 1991.

Honey, R.C.: Dr. Honey graduated from the University of Toronto's dental faculty in 1929. He practised dentistry in Peterborough, Ontario, and was a life member of CDA.

Middleton, H.D.: Dr. Middleton graduated from the University of Toronto's dental faculty in 1951. He practised dentistry in Brentwood Bay, British Columbia, and was a life member of CDA. He died June 28, 1991.

Rogers, D.R.: Dr. Rogers graduated from the University of Toronto's dental faculty in 1939. He practised dentistry in Huntsville, Ontario, and was a life member of CDA. He died August 20, 1991.

Roston, D.: Dr. Roston graduated from the University of Montreal's dental faculty in 1949. He practised dentistry in Weyburn, Saskatchewan, and was a life member of CDA.

Steblyk, P.: Dr. Steblyk graduated from the University of Alberta's dental faculty in 1955. He practised dentistry in Athabasca, Alberta, and was a life member of CDA. He died September 15, 1991.

Totton, J.H.: Dr. Totton graduated from the University of Toronto's dental faculty in 1936. He practised dentistry for over 51 years in Hamilton, Ontario, and was a life member of both the Canadian and Ontario dental associations.

Turner, R.W.: Dr. Turner graduated from the University of Alberta's dental faculty in 1953. He practised dentistry in Edmonton, and was a member of the Alberta Dental Association mediation committee and a director of the Foundation for Dental Education (Alberta).

Weir, W.A.: Dr. Weir graduated from the University of Toronto's dental faculty in 1936. He practised dentistry in Richmond Hill, Ontario, and was a life member of CDA.

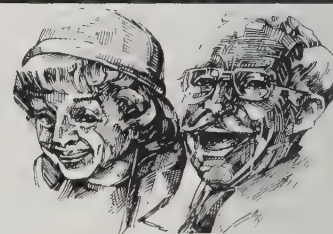
Wisebord, S.: Dr. Wisebord graduated from McGill University's dental faculty in 1990.

DID YOU KNOW ? I'm Getting old

The following note was found tacked to a bulletin board in a senior citizens' home:

We seniors are worth a fortune. We have silver in our hair, gold in our teeth, stones in our kidneys, lead in our feet and gas in our stomachs. And although I'm a little older since you last saw me, I've actually become quite a frivolous old gal. I'm currently seeing five gentlemen every day. As soon as I wake up **Will Power** helps me out of bed, and then I go to **John** next. **Charlie Horse** soon comes along and when he is here he takes a lot of my time and attention. Finally when he leaves **Arthur Ritis** shows up and remains the rest of the day. But he doesn't like staying in place very long. He ends up taking me from joint to joint. After such a busy day I'm really tired and glad to go to bed with **Ben Gay**. What a life! Oh yes, I'm also flirting with **Al Zheimer**.

P.S. The preacher came to call the other day. He said that at my age I should be thinking of the hereafter. I told him, 'Oh, I do, I do. All the time. No matter where I am; in the parlour, upstairs, in the kitchen, or down in the basement, I ask myself, Now what am I here after?'





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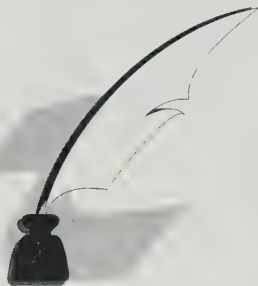
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Letters/Courrier



■ Crest Commercial – It Pays To Voice An Opinion Editor's Note

Last July, Dr. Gregory K. Slater of Toronto was annoyed by the wording used in a new television commercial for Crest toothpaste. He wrote to the president of Proctor and Gamble outlining his concerns, and sent a copy of his letter to the *Journal* as well as to other publications and individuals. We are pleased to reprint the correspondence between Dr. Slater and Proctor and Gamble, as we believe it is indicative of how communication between responsible individuals and corporations can lead to amicable resolutions. (The letters have been edited for brevity.)

■ Dr. Slater's letter to Proctor and Gamble, July 3, 1991

Your current advertisement for Crest toothpaste, is, in my opinion, blatantly irresponsible to the dental profession and the public.

The ad depicts a "university research lab," where a researcher says, "one of the hardest things a dentist has to do is to put that first filling in a child's mouth." Then, with a painful looking expression, and dental instruments clearly visible, he says, "It's really awful."

If the researcher had said, "It's really a shame," then the statement would have taken on a meaning I could support. However, the use of the word "awful" is certain to be interpreted as an awful and unpleasant experience for both the dentist and the patient. The dental experience has been undermined before it even starts.

■ Reply, C.E. Jay, Oral Care Manager, Proctor and Gamble, July 19, 1991

The use of the phrase, "It's awful," in the ad was indeed intended as an expression of "what a shame it is" to have to put a filling in a child's mouth. The thought that it might be misconstrued frankly never occurred to us, as

it did not surface as a concern in any of the research we did to qualify and test the advertisement among consumers and professionals. In addition, it was not raised as a concern by the Canadian Dental Association, who pre-clear all of our advertising.

Despite the fact that the misinterpretation does not appear to be widely held – we received only two letters – we are quite concerned with your suggestion that it might be misconstrued and have initiated a change to the copy, effective immediately.

■ Dr. Slater to Proctor and Gamble, September 19, 1991

I recently viewed the new version of the commercial. The changes you have made nullify any concerns. "It breaks your heart" is a fabulous alternative to "It's really awful." Removing the dental instruments from view is an important change as well. I commend Proctor and Gamble for recognizing valid concerns, acting on them expeditiously, and creating a new version which surpasses expectations.

■ The Environment

I was pleased to read the letter to the editor from Dr. Mary MacKinnon (*Journal*, September 1991) concerning the excessive packaging, inclusion of flyers and the use of recycled paper. To my dismay, the answer from the managing editor was a classic example of the tenet, "If you're not part of the solution, you're part of the problem." The managing editor's concern was the "bottom line."

As health professionals, it would be refreshing to see our leaders and spokespersons (for example, CDA and the *Journal*) adopt a stand of genuine concern for what really matters in our lives instead of perpetuating a public image that sees dollar signs beside our name more prominently than "Doctor."

Let's be part of the solution at every level. We can ask dental manufacturers to reduce their excessive and wasteful packaging, we can implement recycling programs in our offices and discard toxic wastes appropriately. Our office stationery and paper stock can be made of recycled fibres. And so can the pages of our *Journal*.

Lorne Berman, DDS
Sechelt, B.C.

■ As my father is a dentist, I often glance at your magazine. Your Septem-

ber 1991 issue, however, caught my eye because of the beautiful forest scenery depicted on the cover.

One way to preserve such beauty would be to use recycled paper for your publication. Is CDA looking into it for all its publications?

Michael A. Jaeger, BA
Cambridge, Ontario.

■ Keeper of the Springs

Congratulations on your October 1991 editorial, "Keeper of the Springs." The article is timely, to the point and delivers the message. I was wondering how the *Journal* could make sure that every dentist in Canada reads it – perhaps in the form of a separate letter marked "Very Important."

Harvey Allen, DDS
Winnipeg, Manitoba

Editor's Note:

Thanks, but we can't take all the credit for the "Keeper of the Springs" theme. We first read it almost 40 years ago in a book, "Mr. Jones, Meet the Master," a biography of Dr. Peter Marshall, the chaplain of the United States Senate in the late 1940s.

■ American Dental Association Journal

On behalf of the Manitoba Dental Association Board of Directors and membership, I want to thank you for the initiative CDA showed in having the August 1991 ADA *Journal* (*JADA*) sent to every CDA member in Canada. Our executive was discussing the best way to get this information into the hands of dentists in this province when the ADA *Journal* appeared in our offices.

The three "hot button" items of AIDS, amalgam and fluoride are topics that we discuss with our patients every day. Your timely decision to have this *Journal* distributed was very much appreciated.

Tom Breneman, DMD
President, Manitoba Dental Association.

■ Appreciated in the Bahamas

Thank you for the extra copies of the August 1991 *Journal*. We appreciated the story in "News Update" on the presentation your former associate editor, Clarence Metcalfe, gave to Bahamian dentists last March. It appears that Mr. Metcalfe's scholarly address, "The Handpiece and the Pen," has inspired us.

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Last June, three of our members made noticeable presentations to the biennial meeting of the Caribbean Atlantic Region Dental Association. And during Dental Health Week in October, a number of articles written by our members were published in our educational news supplement.

Some of our members are graduates of Canadian dental faculties and others are presently pursuing studies in Canada. With the healthy contributions already established by your *Journal* and Mr. Metcalfe, I am sure these dentists will maintain strong alumni ties to Canadian dentistry.

Hal E. Leyland, DDS

Past President, Bahama Islands Dental Association

Editor's Note:

Dr. Leyland is a life member of the Canadian Dental Association.

■ Dental Lasers and Science

American Dental Laser completely

agrees with the central premise of the July 1991 article, "Dental Lasers and Science," that appeared in the *CDA Journal*.

In summarizing the article, Drs. Dederich and Zakariasen note that: "Lasers do have far-reaching potential for application to dentistry. We, as a profession, must insist that such laser development is done properly, not foisted upon us based on anecdotal reports and incomplete research."

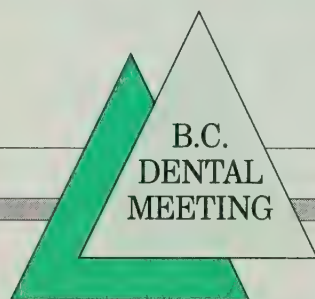
Our company feels strongly that any proposed use of lasers must be based on scientific evidence demonstrating safety and effectiveness. That is why we actively pursue research to establish our product's value for both hard and soft tissue procedures. I would be pleased to send a list of references to any dentist interested in laser research.

Daniel S. Goldsmith

President and Chief Executive Officer

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- ❖ The Future Insurance Guarantee will now be available as a Rider Option. It was felt that including the FIG as part of the previous coverage was not in everyone's best interest. Some participants were paying for an option they may not have needed.
- ❖ The Future Insurance Guarantee, previously unavailable after age 40, is now available up to age 50. This new feature allows all currently insured participants who accept the optional Rider, including those who become uninsurable for medical reasons, to obtain additional insurance. To qualify, you must maintain your membership in the CDA or a co-sponsoring provincial association and qualify for increased coverage under the Income Ratio Guide at the time you exercise your disability FIG option.
- ❖ A new Income Ratio Guide for Long Term Disability will be used so that you can see at a glance the amount of monthly benefit you may purchase. The Guide eliminates any concerns you may have about being over or under insured.
- ❖ Effective January 1, 1992, entitlement to residual disability benefits will require a minimum loss of 15% pre-disability income, net after business expenses.
- ❖ Residual benefits will be payable immediately after the elimination period. There is no requirement to satisfy a period of total disability prior to being residually disabled.

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1992 CDA ANNUAL CONVENTION

Calgary, Alberta

August 29 - September 2

CONVENTION UPDATE

Calgary: More than a gateway to the Canadian Rockies



The Canadian Dental Association's Annual Convention will be held in Calgary, Alberta this year and we anticipate a sell-out crowd. Once again the entire dental team will be out in full force, with the participation of the Canadian Dental Hygienists' Association (CDHA) and the Canadian Dental Assistants' Association (CDAA) re-affirmed.

Calgary is truly a unique destination blending modern, vibrant and action-packed enthusiasm with a strong western Canadian character retained through the pride of Calgarians in their pioneering heritage. And, once again, CDA members are invited to pre-register at no charge for one of the country's most popular annual dental conventions.

This year's convention site will combine the Calgary Convention Centre with downtown hotels located in the heart of the city (the Skyline, the Palliser, the Westin, the Delta Bow Valley and the International Hotel) and the Calgary Stampede and Exhibition grounds. In an effort to bring you a convention where exhibits and lectures are housed under the same roof, the 1992 Convention Committee has decided to utilize the Roundup Centre facility at Stampede Park to house both the exhibit hall and all scientific lectures. Stampede Park is a three-minute ride from the convention hotels aboard Calgary's rapid transit system.

A young, clean and cosmopolitan city, Calgary commands captivating views of the bold and beautiful Rocky Mountains, the gentle foothills and the wide-open peaceful prairies. Calgary is also home to the world famous Calgary Stampede and to honour this tradition, the 1992 Convention Committee is determined to flavour your convention experience with social activities bearing a western twist!

Calgary is Canada's third largest city in area but fifth in population. Surrounded by kilometres of the finest ranch country in the west and just a short distance from the magnificent Canadian Rockies, the Calgary area offers a kaleidoscope of spectacular scenery.

Calgary also has some of the world's finest recreational facilities (courtesy of its memorable 1988 Winter Olympics), hundreds of municipally-funded and private sports facilities, a citywide network of bicycle paths and its own ski area. In addition, it is

only a short drive from the mountain playgrounds of Banff and Lake Louise and less than an hour away from the Olympics' Mount Allan in Kananaskis Country and the greatest trout fishing on the continent in the Bow River.

Although Calgary is situated slightly north of the U.S. border, its climate is pleasantly moderate. Summers are warm with long, sunny days that encourage a variety of activities, from cycling along the tree-lined bicycle paths on Prince's Island to taking in a pleasant paddleboat excursion on the Glenmore Reservoir. The city boasts one of the world's finest zoos, a dinosaur park, a bird sanctuary, a planetarium/science centre and many interesting museums and galleries such as the Glenbow and the Nickle Arts Museum. Culturally Calgary's offerings rival those of larger, more sophisticated cities, with its impressive Centre for the Performing Arts, its symphony, opera ballet and two professional theatres. (By the way, the Phantom of the Opera will be in Calgary during the time of the CDA Convention!).

True to its roots, Calgary is also proud of its country night clubs, well known for their evenings of two-stepping. There are also a variety of night spots along 'Electric Avenue' for singles and the younger crowd.

As Canada's "energy capital", Calgary has a lot to offer, and we urge you to make plans NOW to join your colleagues from across the country for a truly 'electrifying' convention experience at the 1992 CDA Annual Convention, August 29 - September 2 in Calgary, Alberta.

Michel Jahjah, DDS
General Chairman
CDA Conventions



The Olympic Saddledome located at Stampede Park open since 1983.
Photo courtesy of Calgary Convention & Visitors Bureau

Book Reviews

FUNDAMENTALS OF ESTHETICS

by Claude R. Rufenacht

1990, Quintessence Publishing Co., Inc., Chicago

373 pages, color illustrations, \$148 U.S.

Claude Rufenacht, the principal author of *Fundamentals of Esthetics*, intended for this very big, very glossy book to "provide practitioners with the means to ensure or improve the patient's well-being, within the framework of the ageing process."

This grand undertaking is helped by the excellent illustrations and photographs used in the book, a hallmark of the Quintessence Publishing Co, Inc., but it is ultimately scoured by an exceedingly convoluted text. As a result, those who purchase the *Fundamentals of Esthetics* may very well read it as they would a comic-book – from picture to picture.

The book is long, and is based on the view that beauty can be appreciated only with a training in esthetics "for the promotion of individual feelings, in accordance with objective criteria." Beauty is explained from a philosophical and psychological perspective, with ample quotations from Plato, Leonardo da Vinci, and others of similar stature, which are accompanied by big pictures of teeth.

The principles of esthetics – composition, unity, symmetry, etc. – are presented in a manner that is meant to bring the reader from the masterpieces of Greco-Roman art to the harmony between dental restorations and facial composition. So far so good – a plausible argument enticingly presented.

The next three chapters, however, contain the theory of morphopsychology, which is used by the author to link physical appearance with "characterological or psychologic particulars." Humans have directional spirits, animating lives, and bodies to execute – or so we are led to believe – and the successful dentist must recognize and link dentofacial composition to the morphopsychological profile of the patient.

Despite the cartoons of politicians and movie stars, it is a difficult theory to take seriously. Nevertheless, for the reader who makes it through the first hundred pages or so, *Fundamentals of Esthetics* contains a few useful tips on

the arrangement of teeth, although Frush and Fisher, with the Swissdent Corporation of California, tried it all before with much less effort.

The second and third parts of the book are written largely by the auxiliary authors, who describe the art and limited science underlying realistic dental and periodontal restorations. There is, surprisingly, a very regressive description of occlusion by Robert Lee, based on a mechanistic view of the joints and teeth, but there is an excellent chapter on the cosmetic management of gingival recession by Giano Ricci, and the possibilities for improving mucosal contours underlying a fixed pontic is described comprehensively by Claude Rufenacht. Unfortunately, the photographs demonstrating the results of the ridge-pontic augmentations were not encouraging, although they probably reflect the unpredictable status of these techniques at present.

The chapter on gingival management is well illustrated, but the text accompanying the photographs is, to say the least, incomprehensible. Take, for example, the statement that: "An ideal restoration is the utopian reintegration of lost morphotypia," and make of it as you will. There is even a section in this chapter entitled "Globalism and the perioprosthetic gestalt." We are rescued, fortunately, in the last two chapters by Robert Berger's lucid descriptions of metal frames for ceramo-metal restorations, and an equally well-written discussion of porcelain veneers by Robert Nixon.

This book has been an ambitious task, and Claude Rufenacht should be admired for the attempt. He offers an extensive reference to his text, which should help anyone who wants to follow in his footsteps. Although the authors try hard to put a scientific base to dental esthetics, I, for one, was not convinced by much of the theory they offered. No doubt the superb illustrations will serve the lecture circuit well, and there may be room for the full text in an up-market waiting room, but until the text is revised I would hold my money.

Reviewed by:

Dr. Michael MacEntee, professor and chairman of the division of prosthodontics, department of clinical dental sciences,

University of British Columbia

ATLAS OF ORAL DIAGNOSTIC IMAGING

by Tomomitsu Higashi, Jimmy K. Chen Shiba, and Hiroyuki Ikuta

1990, Ishiyaki EuroAmerica, Inc., Tokyo, 270 pages, \$42.50 U.S.

This book is directed at dental students and general dental practitioners. In addition to covering conventional intraoral and panoramic radiographs, which form the basis of diagnostic imaging in dentistry, an attempt has been made to include new imaging methods such as ultrasonography, nuclear medicine, computed tomography, magnetic resonance, and computed radiography. Several examples of all these techniques are included, and the title of the book reflects the desire to extend its range beyond routine radiography.

The reproduction of radiographs is never a simple matter, but I was disappointed with the quality of many of the illustrations. They tend to have high contrast and, as a result, some areas are either too dark or too pale to be discerned. On the other hand, the illustrations of xeroradiographs and computed radiographs were reproduced extremely well. The edge enhancement obtained with these techniques has particular advantages for publication.

Line diagrams have been used extensively and effectively throughout the book. In addition to pointing out the diagnostic features of the images, normal appearances are covered thoroughly. Each chapter starts with a classification of the conditions to be included. Frequently, this exceeds the imaging aspects of disease, and the disclaimer, "Only more common representative radiographs are illustrated in the following pages," that appears with each chapter becomes somewhat repetitive.

Summary tables conclude the chapters. Students will find these an effective aid to learning, though they are sometimes over simplistic. Techniques and principles are discussed whenever they arise, which in one sense is convenient, but produces illogical sequencing. The inclusion of facial clefts and dental caries in the same chapter, for instance, defies logic.

Some of the classifications and diagnoses are controversial. I will not at-

tempt to list these, but, as an example, the osteoma on page 100 has a classical appearance of fibrous dysplasia. In addition, the section on the temporomandibular joint, an important aspect of this subject, is very disappointing. The transcranial and transorbital views are mostly of limited value, and no MR images of the joint are shown. Salivary gland disorders are well presented, however.

The book contains a few typographical errors, which will be corrected at the next printing. Most are merely annoying, but some are more relevant, such as "lingual" instead of "inguinal" on page 217.

Over all, in spite of a few limitations and controversies, I believe this will be a popular and useful book. It contains a good collection of interesting material.

Reviewed by:

Colin Price, BDS, FDSRCS, MDS, FRCD(C), FACD, professor and chairman, division of oral radiology, faculty of dentistry, University of British Columbia

PRECISION FIXED PROSTHODONTICS: CLINICAL AND LABORATORY ASPECTS

by M. Martognoni and Alwin Schonenberger

1990, Quintessence Publishing Co. Inc., Chicago, 580 pages, color illustrations

From the outset, the authors declare that their book will deal with the problem of dental restorations in an entirely new way. The text is aimed at dentists and dental technicians interested in understanding the biological principles behind crown construction and the problems that may arise in placing a crown restoration near the dentogingival junction.

The authors use a consistent and logical sequence in each of the chapters, dealing initially with dentoperiodontal relationships, and following the sequence of treatment through biologic principles of tooth preparation to crown cementation. The scope of the material is quite extensive, but it is enhanced by series after series of especially vivid and useful color illustrations. Both the laboratory and clinical photographs are exceptional in their clarity, color reproduction, and illustrative efficiency.

Exhaustive research material is included in *Precision Fixed Prosthodontics: Clinical and Laboratory Aspects*,

but it is combined with occasionally labored writing. In addition, the placement of the reference list at the end of the book makes it difficult to undertake a quick analysis of the literature mentioned in the text.

The initial chapters centre on the dentoperiodontal relationships and principles of concern to the position of the metal ceramic crown margin and its configuration. The authors present in great detail their methods for gathering information about the prepared tooth from tissue handling, impression making and production of the cast. Although some aspects of the material presented may conflict with conventional teaching methods, the authors' step-by-step approach will provide many helpful hints to both the dentists and the dental technician alike.

In Chapter 7, "The Casting," and Chapter 8, "Standardization of the Casting System and Parameter of Mechanical Precision," the authors present an in-depth analysis of their techniques in transforming a wax coping into metal. The reader, unless involved in some research activity, may find this area of discussion quite intimidating in its detail. Much data is presented, but the authors do encourage the dental technician to create an individual, customized sating system, capable of guaranteeing a standard level of work, regardless of the choice of casting equipment.

Chapter 9 is concerned with the final laboratory stage of porcelain application. The authors analyze porcelain veneer application and how it is affected by different types of marginal finish. An analysis of cementation and final precision of the restoration follows, with the presentation of the authors' research findings on cementation procedures utilizing a stereomicroscopic method of evaluation.

One can only be in awe of the efforts that the authors have placed in attempting to produce the ideal biologically acceptable restoration, and the text serves as a true mirror of their work.

Reviewed by:

John J. Carpendale, BDS, M.Sc.D., clinical assistant professor in prosthodontics, department of clinical dental sciences, University of British Columbia.

GUIDE PRATIQUE DU CONTRÔLE DE L'INFECTION EN CABINET DENTAIRE

par: E. BINHAS et P. MACHTOU

1ère édition. C. d P. Paris, 1991.

Vient de paraître aux éditions C. d P. (Paris) un ouvrage inédit sur le contrôle de l'infection pour le dentiste et son équipe. Cet excellent livre est écrit d'une façon simple et compréhensible, à la portée de tout le monde, sans pour autant faire souffrir sa valeur scientifique.

"C'est un guide pratique et ne se prétend pas un manuel de science fondamentale." Il consiste en une préface qui fait le point sur l'infection, d'une table des matières très bien structurée, d'une introduction des auteurs et d'un bref aperçu historique avant d'aborder la matière proprement dite qui est divisée en trois parties:

1) Pourquoi être hygiéno-conscient?

Cette partie traite des infections possibles en cabinet dentaire. Présentée sous forme de questions et réponses qui couvrent l'essentiel du sujet, ex.:

-Quelles maladies peut-on contracter en milieu dentaire?

Nombreuses et classifiées en trois groupes différents (le SIDA et l'hépatite B formant le troisième).

Nous rapportons ce détail car nous ne voulons pas que les praticiens soient sous l'impression que ces deux seules maladies constituent l'essentiel du volume. Certes elles sont graves et mêmes mortelles, mais plusieurs autres conditions pathologiques sont aussi contractables en cabinet dentaire: ainsi le rhume (supposé banal), la grippe, la mononucléose, la rougeole et la rubéole (qui peuvent entraîner des malformations du fœtus chez la femme enceinte) etc., etc.

-Quels sont les risques pour le dentiste et son personnel?

-Que faire si l'on soupçonne un patient d'être porteur du virus du SIDA?

-La salive est-elle plus contaminante pour le virus du HBV que pour celui du SIDA?

Très bonne question, car il faut admettre qu'aujourd'hui à cause des publicités tapageuses, du rôle des médias d'information, des manifestations publiques et exubérantes des gais et lesbiennes un peu partout à travers le monde: l'attention de plusieurs cliniciens est surtout axée sur le SIDA, et on semble négliger d'autres faits fondamentaux, ex.: Le Virus du HBV est de beaucoup plus résistant à l'environnement que celui du SIDA.

De ces questions-réponses, il y en a exactement 13.

Le contrôle de la contamination est aussi bien détaillé, à partir des mains du dentiste jusqu'à l'air de la pièce, tout en

passant par le mobilier et l'équipement dentaire. Aussi, tout ce qui est d'une importance magistrale est imprimé en gros caractères, sur un fond gris, ex.:

-Conduite à suivre en cas de blessure accidentelle.

-Brosse à dent et contamination (saviez-vous que le virus du HBV peut rester infectant pour plus de 48 heures sur une brosse à dent humide, et celui de l'herpès jusqu'à sept jours?).

2) Mesures à prendre pour devenir hygiéno-vigilant:

Cette partie est la plus longue, soit 85 pages sur un total de 135. Son but est d'élaborer sur les trois objectifs fixés par l'ADA (American Dental Association) pour la lutte contre l'infection en cabinet dentaire. Tout y est de façon méthodique:

-Mesures à prendre pour le patient.

-Mesures à prendre pour le dentiste et son assistante.

-Vaccination.

Et ici, nous nous permettons d'ajouter qu'une contre-indication au vaccin ENGERIC-B (contre le HBV et employé surtout en Amérique du nord) est l'allergie aux levures ou à la bière, et ceci parce qu'une fraction protéique du virus HBV est recombinée dans une même levure que l'on utilise dans la fabrication de la bière.

-Les mains, leur lavage et les gants

-Le visage, les yeux et les masques

-Mesures à prendre pour la réceptionniste et le technicien dentaire

-L'entretien ménager du cabinet dentaire en fonction de l'hygiène

-Mesures à prendre pour l'équipement et le matériel dentaire

-La désinfection

-La stérilisation

Tout ce qui existe en relation avec ce sujet est non seulement mentionné, critiqué mais aussi passé au crible. Et si des fois, mention est faite de certains produits qui nous sont inconnus car de fabrication européenne, il faut tout de même admettre que l'essentiel de la matière est toujours là pour entraîner le dentiste à une méthodologie scientifique du contrôle de l'infection, ex.: Les gants: peu importe où ils sont fabriqués. Il y en a toujours deux sortes. L'une en vinyle et qui est bonne pour ce qu'on appelle dans le jargon Québécois "la vaisselle," et l'autre en latex qui comprend d'une part les gants de soins, et d'autre part les gants de chirurgien. Peut-on laver les gants? Oui, nous dit une étude britannique récente; à condition d'employer des savons à base de chlorhexidine ou de bétadine.

Idem au premier chapitre, les citations d'intérêt spécial sont imprimées sur fond gris, il y en a environ une quarantaine. De plus une vingtaine de tableaux et plusieurs schémas sont là pour résumer et faciliter la lecture du texte. Et pour terminer cette partie, un résumé de la matière en fonction des différentes spécialités: de la pratique générale à l'implantologie en passant par toutes les autres disciplines.

3) La troisième partie porte sur les applications pratique du contrôle de l'infection qui sont présentées sous forme de CHECK-LIST (terme employé dans le livre). Il y en a 21, et chacune d'entre elles est une référence méthodique des séquences gestuelles et opératoires en fonction de l'acte et de la situation, tant pour le praticien que pour son assistante. Le choix est si varié que tout praticien trouverait facilement la ou les listes qui conviennent à son style de pratique, c'est-à-dire sa propre gestion du temps par l'ergonomie (d'après les propos des auteurs).

Conclusion:

En somme, on est bien content de voir qu'un si bel ouvrage en langue française ait enfin vu le jour; car le contrôle de l'infection est immuablement le sujet le plus à jour et le plus épineux pour le dentiste et son équipe

depuis déjà plus d'une décennie, et surtout que jusqu'à récemment l'essentiel de cette science était d'une part concentré dans les manuels de langue anglaise et d'autre part présenté à la profession de façon pêle-mêle à travers les conférences et les articles scientifiques dans les périodiques dentaires. Il n'y avait point de livre spécialisé dans cette discipline en langue française.

Nos félicitations aux auteurs. L'ardeur consacrée pour la réalisation de cet ouvrage spécialisé dans le contrôle de l'infection au cabinet dentaire sera longtemps appréciée. De plus, la méthodologie et la simplicité de la présentation en font un manuel de référence quasi obligatoire pour les étudiants et les dentistes francophones qui à leur tour transmettront la connaissance à l'équipe dentaire, soit: l'hygiéniste, l'assistante, le technicien et la secrétaire, afin que tous et chacun collaborent et travaillent dans une orientation hygiéno-positive.

Critiqué par:

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DID YOU KNOW ?

The Most Commonly Used Drugs

The National Institute on Drug Abuse (USA) conducts an annual survey on drug use. The numbers listed below are based on statements by Americans over the age of 12 who admitted to having used drugs for non-medical reasons. Medications obtained by a medical prescription are not included. Their calculations are based on an estimated American population of 201,187,983.

Those who say they have used drugs in the previous month:

Alcohol 102,919,000

Cigarettes 53,633,000

Marijuana & Hashish 10,206,000

Smokeless Tobacco 7,111,000

Cocaine 1,601,000

Analgesics 1,536,000 (includes Darvon, Demerol, Percodan, Tylenol with Codeine)

Inhalants 1,188,000 (lighter fluids, hair & paint spray, cleaning solvents)

Stimulants 957,000 (amphetamines, diet pills, Preludin)

Tranquilizers 568,000 (Librium, Atavan, Valium, Metrobamate)

Sedatives 568,000 (barbiturates, sleeping pills, Seconal)

Hallucinogens 553,000

Crack 494,000

Heroin 48,000

(Source: Washington Post Health, March 28, 1991)



The DAP Advisor

The DAP Advisor offers information, ideas and advice to improve dentist/patient communication, raise awareness about good dental health, and help your practice become busier.*

Phone Finesse Part 1: Incoming Calls

What's the most important piece of equipment in your practice? Your dental chair? Your X-ray machine? Your cavitron? Well, if you think about it, the telephone is probably your most important piece of equipment. It generates much of your business and enables you to build and maintain a thriving practice.

The person in charge of this crucial piece of equipment is your receptionist. She (or he) connects you with the outside world, and the opinion people form of your practice will largely be based on their impression of her. In fact, you might think of this person as your public relations and sales representative. After all, she (or he) can instill confidence in potential patients, reinforce it in current ones and build the good will of both. And, to a large extent, that's what keeps you in business.

And yet, good telephone skills are so simple and so basic that they are often easy to overlook. What follows is a list of 10 skills that every receptionist should master. While they may seem obvious to you, remember, they probably won't to someone who has never used them.

Ten Basic Phone Skills or: What Every Receptionist Should Know

1. If you can, let the phone ring twice before you answer. That will give you a chance to take a breath and think about what you're going to say. Three rings is probably okay too, but any more than that and the person on the other end might become impatient and perhaps even hang up.
2. Identify the doctor (or the name of the practice) and yourself. For example, say "Good Morning, Dr. Anderson's office, Christine James speaking."
3. Smile. It will make you feel cheerful and help you convey that feeling to the person at the other end.
4. Ask for the caller's name early so you can use it during the rest of the conversation. It will help establish a personal connection with the caller.
5. Make sure you have a pen and paper handy to record any information.
6. Choose your words carefully. What you say is as important as how you say it. If the dentist is unavailable and the caller wants to speak to him (or her), don't say "The doctor can't talk to you now. He's busy." Instead, say, "I'm sorry, the doctor's with a patient right now. Can I take a message" (or, "can I help you with something?").
7. If you have to interrupt a conversation to answer another line or talk to someone in the office, excuse yourself and give the reason for the interruption. Say, "Could you please hold a moment while I get the other line?" or "I'm sorry, someone here wants to ask me something. Could you please hold on a moment?"
8. If you're placing a call for another member of the dental team, make sure that person is available to talk as soon as the connection has been made.
9. Don't talk with gum in your mouth (even if the gum is sugarless). In fact, don't talk with food, cough lozenges or anything else in your mouth.
10. Always hang up last. It's a common courtesy.

One of the receptionist's most important, if most basic, tasks is to keep an accurate record of incoming calls when you're out. This phone record should include the following information:

- The name of the person who called (make sure the spelling is correct)
- The number at work and/or home where he or she can be reached
- The reason for the call and the day, date and time it came in
- If call is to be returned, along with some indication of when, or that no return call is needed.



The DAP Advisor is a service of CDA's Dental Awareness Program, an ongoing campaign dedicated to helping all Canadians keep their teeth Good For Life.

**Back by popular demand. This DAP Advisor was first published in the January 1990 CDA Journal.*

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CDIP: Still Your Best Insurance Choice

There have been a number of recent developments in the Canadian Dentists' Insurance Program (CDIP) for 1992. These changes are important to you. They offer stability of coverage, competitive rates, unique benefits and special features through an updated, improved program. We ask you to review them carefully, as they provide solid evidence that CDIP continues to be your best insurance choice.

Change of Insurer

On January 1, 1992, CDIP placed its basic life insurance, dependents' life insurance, long-term disability insurance (LTD), office overhead expense insurance and the dentists' staff insurance plans with the Prudential Group Assurance Company of England (Canada).

As a participant in CDIP, you will lose no coverage due to this change in insurers. For over 30 years, Canadian Dental Service Plans Inc. (CDSPI)'s objective has been to provide the best possible insurance plan and the best possible service package to Canada's dental profession. Our new affiliation with Prudential Group Assurance will allow us to continue to meet that objective.

Earlier this year, Metropolitan Life, the current insurer, advised us that major premium increases were planned for 1992. These increases were due to the dramatic rise in the number of disability claims processed by the company over the previous two years. CDA's executive council felt that the magnitude of the planned premium increases was totally unacceptable. CDSPI and its insurance consultant, TPF&C, were therefore authorized to put CDIP out for tender. After a careful evaluation of all the proposals received, CDA's executive council approved the Prudential Group Assurance Company of England (Canada) as the insurer for CDIP's various plans (as indicated above).

About Our New Insurer

Prudential Group Assurance is a division of the seventh largest insurance organization in the world, with assets in excess of \$70 billion. The company has worked closely with associations for over 35 years, designing packages

to meet the special needs of these groups. For example, it has been the insurer for the Ontario Medical Association since 1956. Some of its other clients include both the Quebec and Manitoba medical associations, the Certified General Accountants Association and the Ontario Teachers Association.

As previously mentioned, there has been a major increase in the number of disability claims handled under CDIP. As a result, Metropolitan Life was required to pay out much more than it anticipated when it originally set its premium rates for the program. Our new insurer carefully assessed this "claims experience," as did all the other insurers who were asked to quote. Prudential won the CDSPI contract on the basis of the benefits it could offer our CDIP participants, its very competitive rates, its experience with similar association plans and its financial stability.

Prior Record of Benefits to Continue

Prudential Group Assurance is aware that participants in CDIP have enjoyed exceptional benefits including:

- Five consecutive years of discounts on basic life premiums, ranging from 16 per cent to 24 per cent.
- No premium increases in office overhead expense insurance in the past 14 years, and only one increase in LTD rates.

In 1992, this record of providing the best plans at the best prices will continue.

Summary of Plan Changes

Please note: In 1992, you will have the option of including or excluding certain riders in your coverage. There will be a separate premium for each rider.

In addition, there will be rate increases in the premiums for basic life, long-term disability and office overhead expense insurance due to the increase in the number and length of duration of claims. This "claims experience" reflects what is happening in the marketplace generally.

The following are the most significant changes to the life and disability plans:

Basic Life

- Future insurance guarantee will be a rider option available to participants until age 50.
- Under the waiver of premium feature, the new definition of total disability means that you are covered if "you are unable to perform the duties of your regular occupation as a result of sickness or injury and you are not gainfully employed in any other occupation."

Dependents' Life/LTD/Office Overhead Insurance

The definition of "total disability" that is used in the Basic Life package applies here as well.

LTD/Office Overhead Insurance

- Future insurance guarantee will be a rider option, available to participants until age 50.
- The seven-day elimination period for LTD will no longer be available. Coverage will automatically be converted to a 30-day elimination period. For office overhead coverage, the seven-day elimination period changes to a 14-day elimination period.
- A minimum income loss of 15 per cent pre-disability, net after tax income is required for residual disability benefits.

The "own occupation" definition of total disability will be a rider option.

LTD

- The 10 per cent simple interest COLA option will no longer be available. It will be replaced by a provision that allows for annual increases in your disability benefits in accordance with changes in the Consumer Price Index (CPI) subject to a maximum of eight per cent per year.

- An income ratio guide will now be used to calculate the maximum benefit payable during disability.

For Over 30 Years, the Best Protection and Service

CDIP is owned and operated by the Canadian Dental Association and the cosponsoring provincial associations. CDIP is administered by CDSPI.

Everyone who participates in CDIP can be assured that they are covered by what we believe is the most comprehensive insurance program available. CDIP's record of providing competitive plans will continue through our new affiliation with Prudential Group Assurance. If you have any questions or concerns, please feel free to call us.

And remember, you lose no coverage due to these changes. The Canadian Dentists' Insurance Program (CDIP) is still your best insurance choice.

Did You Know? Beatitudes for friends of the aged

Blessed are they who understand
my faltering step and palsied hand.

Blessed are they who know that my
ears today must strain to catch the
things they say.

Blessed are they who seem to know that
my eyes are dim and my wits are slow.

Blessed are they who looked away
when coffee spilled on the table today.

Blessed are they with a cheery smile
who stop to chat for a little while.

Blessed are they who never say
"you've told that story twice today."

Blessed are they who know the ways
to bring back memories of yesterdays.

Blessed are they who make it known that
I'm loved, respected and not alone.

Blessed are they who know I'm at a loss
to find the strength to carry the cross.

Blessed are they who ease the days
on my journey home in loving ways.

(Anonymous)

CFDE Grant Applications Due

The deadline to apply for a CFDE dental education, research or service project grant is December 31, 1991.

Each year, CFDE supports a variety of individual education, research and service projects to promote and improve the quality of dental education, and to help increase public awareness of dental care. Preference is given to projects affiliated with dental schools and dental auxiliary programs.

Applications should be submitted in letter form, and must contain a full description of the proposed project, including a budget and funding sources.

For further information, please contact:



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	October 31, 1991	September 30, 1991
Bond & Mortgage Fund	88.59603	87.32448
Common Stock Fund	17.13577	17.03636
Money Market Fund	58.08329	57.70672
Balanced Fund	33.65491	33.26178

G.I.C. Fund Term	*Interest rates as at	
	October 31, 1991	September 30, 1991
1yr	8.10%	8.60%
2yr	8.60%	9.10%
3yr	9.10%	9.35%
4yr	9.35%	9.60%
5yr	9.60%	10.10%

(*rates subject to change without notice.)

Total Assets (market value) of the Plan as of

October 31, 1991	September 30, 1991
\$146,691,145.30	\$145,345,017.90

For further information:

Write :

or phone, toll free:



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Library/Bibliothèque

Package Libraries For 1991

For a Limited Time, CDA Members Can Obtain Any Two of These Packages for Just \$5 Plus Applicable Taxes. This offer is valid until January 31, 1991.

- Mercury in Amalgam
- Tooth Bleaching
- TMJ and Whiplash Injuries
- Composite Resins
- Periodontal Grafts
- AIDS: Oral Manifestations
- AIDS: Infection Control Procedures
- AIDS: Ethical Considerations
- Dental Emergencies
- Computer Imaging
- Computers In the Dental Office
- Sports Dentistry
- Child Abuse
- Financial Planning (Retirement)
- Dental Radiography
- Computers in the Dental Office

Dental Bonding materials

Matériaux dentaires adhésifs

1. Barkmeier, W.W. and Latta, M.A. "Shear bond strength of Dicor using resin adhesive systems and light activated cement." *J. Esthet. Dent.* 1991;3(3):95-9.
2. Beck, D.A. and others. "Shear bond strength of composite resin porcelain repair materials bonded to metal porcelain." *J. Prosthet. Dent.* 1990;64(5):529-33.
3. Black, S.M. and Charlton, G. "Survival of crowns and bridges related to luting cements." *Restorative Dent.* 1990;6(3):26-30.
4. Burke, F.J. "Dentine bonding agents - optimizing the use of composite materials." *Dental Update.* 1990;18(3):96, 98-102.
5. Chan, K.C. and others. "Microleakage of seven dentin bonding agents." *J. Esthet. Dent.* 1990;2(6):159-61.
6. Fitchie, J.G. and others. "Microleakage of two new dentinal bonding systems." *Quintessence Int.* 1990;21(9):749-52.
7. Fox, N.A. "Fluoride release from orthodontic bonding materials." *Br. J. Orthod.* 1990;17(4):293-8.
8. Hinoura, K. and others. "Factors of glass-ionomer cements influencing the



- bond strength to resin composites." *Dent Mater.* 1990;6(2):94-8.
9. Kanca, J. "One-year evaluation of a dentin-enamel bonding system." *J. Esthet Dent.* 1990;2(4):100-3.
 10. Kubo, S. "Principles and mechanisms of bonding with dentin adhesive materials." *J. Esthet Dent.* 1991;3(2):62-9.
 11. MacSween R. and Price, R.B. "Peel bond strengths of five impression material tray adhesives." *J Can Dent Assoc.* 1991;57(8):654-7.
 12. McDonald, N.J. and Dumsha, T.C. "Evaluation of the retrograde apical seal using dentin bonding materials." *Int Endod J.* 1990;23(3):156-62.
 13. McInnes, P.M. and others. "Effect of dentin surface roughness on shear bond strength." *Dent Mater.* 1990;6(3):204-7.
 14. Reid, J.S. "The effect of bonding agent and fissure sealant on microleakage of composite resin restorations." *Quintessence Int.* 1991;22(4):295-8.
 15. Retief, D.H. "Adhesion to dentin." *J. Esthet Dent.* 1991;3(3):106-13.
 16. Roeder, L.B. and others. "Bond strength of repaired glass ionomer core materials." *Am J Dent.* 1991;4(1):15-8.
 17. Saunders, W.P. and others. "The effects of dentine bonding agents on marginal leakage of composite restorations." *J. Oral Rehabil.* 1990;17(6):519-27.
 18. Schoenrock, G.A. "Dentin bonding agents. A Buyers guide." *Dent. Today.* 1990;9(4):33-4.
 19. Schwartz, R. and Davis, R. "Delayed cementation and bond strength of dual-cure cements." *Am J Dent.* 1991;4(2):86-8.
 20. Smales, R.J. "Effects of enamel-bonding, type of restoration, patient age and operator on the longevity of an anterior composite resin." *Am J Dent.* 1991;4(3):130-3.
 21. Tagami, J. and others. "Correlation among dentin depth, permeability, and bond strength of adhesive resins." *Dent Mater.* 1990;6(1):45-50.
 22. Tsai, Y.H. and others. "Comparative

study: bond strength and microleakage with dentin bond systems." *Oper Dent.* 1990;15(2):53-60.

23. Wang, W.N. "Bond strength with various etching times on young permanent teeth." *Am J Orthod Dentofacial Orthop.* 1991;100(1):72-9.

New Library Acquisitions

Nouvelles acquisitions

1. Beumer III, John. *The Branemark implant system: clinical and laboratory procedures.* St Louis: IEA, 1989.
2. Carlson, David S. *Orthodontics in an aging society.* Ann Arbor, Michigan: Center for Human Growth, 1989.
3. Dunlap, Joe E. *Knowing the numbers: gain and retain control of your practice.* Tulsa, Okla.: PennWell, 1989.
4. Ferguson, D.B. *Aspects of oral molecular biology (Frontiers of oral physiology, vol 8).* Basel: Karger, 1991.
5. Hillam, Christine. *The roots of dentistry.* London: British Dental Association, 1990.
6. Howat, Alison P. *Color atlas of occlusion and malocclusion.* St. Louis: Mosby, 1991.
7. Hudson, J.W. *Management of cleft lip and palate (Oral & Maxillofacial Surgery Clinics of North America, Vol 3:3).* Philadelphia: Saunders, 1991.
8. Mongini, Franco. *Craniomandibular and TMJ orthopedics.* Chicago: Quintessence, 1989.
9. Kanatake, Tetsuya. *Predictable advances in oral health research: in commemoration of the centennial anniversary of Tokyo Dental College.* Chiba, Japan: The College, 1990.
10. Ranalli, Dennis N. *Sports Dentistry (Dental clinics of North America, Vol 35:4)* Philadelphia: Saunders, 1991.
11. Richardson, Andrew. *Interceptive orthodontic.* London: British Dental Association, 1989.
12. Spurgeon, David. *Secrets of the heart: cardiovascular research.* Ottawa: Medical Research Council Canada, 1991. Also available in French.
13. World Health Organization. *Beryllium (Environmental Health Criteria 106).* Geneva: The Organization, 1990.
14. World Health Organization. *Inorganic Mercury (Environmental Health Criteria 118).* Geneva: The Organization, 1991.

Dental Student's Forum

Safety and Tooth Whiteners

Vinh P. Le
McGill University, Faculty of Dentistry
Montreal

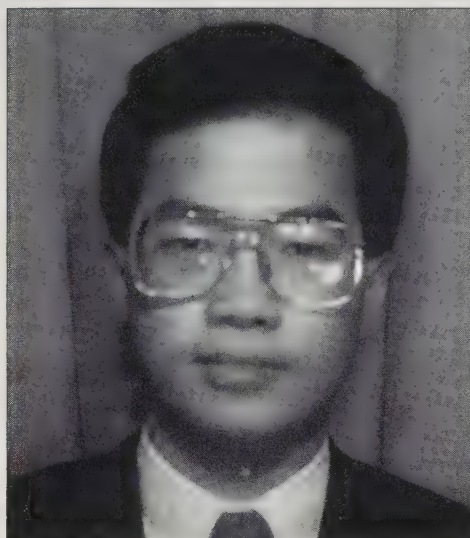
In 1989, Dr. Van B. Haywood and his co-workers introduced the night-guard vital bleaching technique to the dental profession, and with it the concept of patients whitening their teeth at home.^{2,3} Since then, more than a dozen tooth whiteners have been marketed, including Brite Smile, Denta-Lite, UltraLite and Whiter Teeth.

Most of these products cannot be obtained without a dentist's prescription, but some, Natural White and EpiSmile, for example, are sold over the counter as cosmetics. Tooth whiteners work, too, as long as the user's teeth are not badly stained. The problem is that no one really knows if they are safe.¹

Unlike the traditional in-office method for vital bleaching, where a rubber dam is used to isolate the tooth whitener from the patient's mouth, the in-home technique exposes the oral cavity to the whitening agents over a long period of time. In some cases, the patient actually sleeps with the whitener in his or her mouth, with the product contained by a custom-made tray. It is safe to conclude that these patients must swallow at least a small amount of the whitener.

Most in-home tooth whiteners contain carbamide peroxide gel, a crystal that reacts with water to release hydrogen peroxide and, in turn, liberate free oxides. Although the potential long-term hazards of using tooth whiteners are still unknown, there is concern that unsupervised exposure to hydrogen peroxide and/or free oxides could have serious health consequences.

Dr. Chakwan Siew, the head of the American Dental Association (ADA) Research Institute's department of toxicology, has referred to oxygen free radicals, which are released in the mouth by tooth whiteners, as a "very active species." He also claims that hydrogen peroxide, used in other contexts, has been shown to have mutagenic potential, and says that it can: increase the effect of known carcinogens, delay wound healing, inhibit certain pulp enzymes, damage the periodontal tissue, alter the normal oral flora – resulting in hairy tongue



Vinh P. Le

– and lead to chronic oral infection from opportunistic organisms such as *candida albicans*.

Will patients using tooth whiteners experience similar or other side effects? No one knows. And to make matters worse, the people who opt for over-the-counter kits may suffer from tissue irritation, inflammation or chemical burn, which will go undiagnosed unless they regularly attend their dentist or doctor.

So, while he acknowledges that tooth whiteners *may* be safe, Dr. Kenneth Burrell, the secretary of ADA's council on dental therapeutics, stresses the need to be extra cautious with them. "The reason these products work is the same reason we are concerned with safety," he said. "Free oxygen radicals have the potential for causing cellular change."¹

Research conducted by Dr. Sigmund Weitzman and his team supports this view. Dr. Sigmund found that a mixture of hydrogen peroxide and a known carcinogen (DMBA), applied topically, could cause carcinomas to develop on the buccal epithelium of hamsters.

Despite these potential side effects, there have been no reports where definite hazards were *specifically associated* with tooth whiteners. In fact, a number of short-term studies on the use of these products have produced very

positive results.

Dr. Harvey Putter and Dr. Ron Jordan tested the Rembrandt Lighten System on 35 individuals – the number of patients was later updated to 75 – and found no localized or systemic toxicity on initial examination or during a six-month recall examination. Dr. Jordan reported a definite improvement in tooth shade for these patients, and, in some cases, an enhancement of gingival conditions. Similar results have been reported by Drs. Van Haywood and Harald Heymann of the University of North Carolina, who tested Proxigel.

And in a recent animal and tissue-contact study, Dr. Chris Wolverton, a biologist at Austin College, found that a 10 per cent carbamide solution was no more toxic to tissues than certain dental cements, mouthwashes or toothpastes. He detected no potential, systemically, for mutagenicity.

To make an objective decision on the tooth whiteners issue, one has to look closely at the data available. ADA's concern for public safety, as it relates to these products, is based on non-related studies, where hydrogen peroxide was used in other contexts and at different concentrations than it is in most tooth whiteners (10 per cent carbamide peroxide). Given the fact that these studies were not specifically designed to look at the side effects of bleaching, their results should only be extrapolated with care.

In many ways, the tooth whiteners' controversy resembles the debate over the use of mercury in dental amalgams. There is little doubt that hydrogen peroxide, and mercury for that matter, can be hazardous in some situations. However, very little is known about the health effects of hydrogen peroxide when it is encountered at the concentrations used in bleaching kits.

Yes, the specific studies that have been done, while short-term in nature, have yielded what seem to be very positive results. Until a conclusive study has put its concerns over the long-term effects of tooth whitener use to rest, however, ADA has good reason to worry.

Initially, vital bleaching was introduced to whiten the teeth of patients whose appearance had been marred by disfiguring tetracycline stains. Today, however, most consumers of tooth whiteners are looking for nothing more than a super-white Hollywood smile. In-home whiteners are being used not as a necessity, but as a luxury or cosmetic.

This indiscriminate use of these products should be discouraged, at least until they are shown to be completely safe. For starters, the companies involved in manufacturing and promoting tooth whiteners should be more restrained in their advertisements. And, finally, over-the-counter whiteners should be discontinued. Tooth whiteners should only be available with a dentist's prescription. This would allow the dentist to screen patients for appropriate cases, inform them of potential outcomes and provide important instructions and follow-ups.

Vinh P. Le is a student in the faculty of dentistry at McGill University.

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ADA's executive editor, Dr. James H. Berry.

References

1. Berry, J.H. What about whiteners?, Safety concerns explored. *JADA*, 121(2):223-225, 1990.
2. Goldstein, C.E. et al. Bleaching vital teeth: state of the art. *Quintessence Int.*, 20(10):729-737, 1989.

3. Haywood, V.B., Heymann, H.O. Nightguard vital bleaching. *Quintessence Int.*, 20(3):173-176, 1989.

The views expressed in this article are those of the author, and are not necessarily those of the Canadian Dental Association.

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Avoiding The "Necessary" Evil — Delinquent Accounts

At first glance, the title of this article may have struck you as being too good to be true. You probably thought to yourself, 'It's impossible to avoid having delinquent accounts. All practices are plagued by this affliction, it's just a fact of life in dentistry.'

Or is it? Delinquent accounts may be a widespread malady in dental practice, but that doesn't mean you can't get rid of them. They're an evil, true, but certainly not a necessary evil.

The Domino Effect of Delinquent Accounts

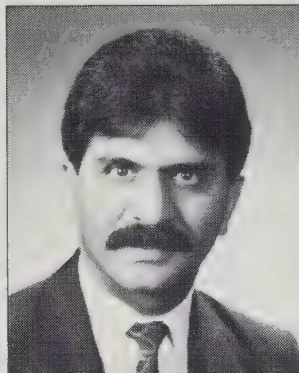
Delinquent accounts are more than just a collection problem. Not only do they reduce cash flow, they also cause tremendous pressure in the practice by leading to weak referrals, weak case presentations, and an increase in no-shows and cancellations. Once you start the whole collection process — making phone calls, and sending out statements — a negative feeling will be created in the patient's mind. And this inevitably leads to a lack of cooperation by the patient (no referrals, etc.).

Delinquent accounts create a myriad of practice management problems, and will persistently haunt the afflicted practice if they aren't brought under tight control.

Prevention Is The Key

There is only one way for an account receivable to become delinquent — when the amount owed isn't properly collected to begin with. You can eliminate most of your delinquent account problems by understanding how to establish effective payment options in your practice, and by communicating this financial policy to both your team and your patients.

When creating payment options, have your staff participate in the process so that they will develop a sense of ownership for your financial policy. (Your team will be much more willing to consistently adhere to a policy that they've contributed to.) Make sure your team members understand the policy and that they develop the verbal skills



*Imtiaz Manji
B.Sc.
President of
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needed to communicate it to your patients.

Examine the payment options you're offering. In addition to cash, will you accept credit cards, cheques and post-dated cheques? Do you have counter cheques on hand (available from the bank) in case a patient forgets his or her cheque book? (If a patient doesn't have his or her bank account number on hand, have that person fill out a counter cheque and sign it. The missing account number can be taken over the phone.)

Another option recently adopted by some dental practices is the use of dental credit cards. These cards work much like Visa and MasterCard cards, but are targeted specifically for use in dental practices. (They do not affect a patient's credit on any other credit cards.)

Make No Exceptions

No matter how great the temptation, you must adhere to your financial policy. All too often, it is the dentists themselves who break the rules, by allowing personal friends or well-known patients to be exempt from the practice's financial policy. Remember, you aren't doing these people any favors, because the money they owe has to come in at some point. And you are creating a difficult situation for your team, as nobody likes making collection calls, particularly to these patients.

In reality, allowing the accounts of friends and special patients to become delinquent is the worst thing you can do — it all but guarantees that your treasured relationships will be jeopardized, if not totally ruined.

Getting your team (and yourself, for that matter) to embrace the practice's financial policy is only half of the battle. You now have to get your patients on side. Basically, your patients must be made fully aware of their financial responsibilities before services are rendered. First communicate, then actuate. If you put your financial policy neatly on the table, you'll be amazed at how receptive your patients will be. Clear, upfront payment options make it easy for your patients to rise to the occasion of financial responsibility.

Success in securing payment upfront is dependent on two things: having as many payment options available as possible and a staff that is comfortable with communicating your financial policy. The right approach, a positive attitude and refined verbal skills will win 90 per cent of the collection battle. There is no substitute for people power when it comes to collections, so make sure your front desk person exudes confidence and pride in your financial policy, your fees and the quality of care you provide.

Offering Some Flexibility: Financial Arrangements

Clearly, your first option is to have patients settle their account on the same day they receive treatment, i.e. before leaving your office. But when developing financial policy, you need to decide — in advance — how far you are willing to go if a patient cannot pay through one of your basic payment options. You have to consider every "what if" situation. (What kind of financial arrangements are your staff allowed to make and what is definitely taboo.)

For instance, if a patient tells you at a case presentation that he or she cannot afford to pay for the prescribed treatment, despite the available payment options, know how you will handle this. If you're going to extend credit, decide how much and over what period of time. (I advise against going beyond six months.) And make sure you collect a down payment — up to 50 per cent of the fee for the services being rendered is reasonable — so that most of your

overhead, particularly your out-of-pocket expenses such as laboratory fees and supplies, will be covered. Whatever you decide, all financial arrangements must be supported by the "collateral" of post-dated cheques.

I recommend that you do not mention your special financial arrangements in a policy statement, practice brochure or letter. By saying upfront that these payment options are available, you're inviting patients to use them. If a patient was prepared to pay in cash, and you offer him or her the opportunity to pay over time, the latter option is almost sure to be chosen.

Special financial arrangements should only be considered when and if necessary – that is, when a patient is not prepared to pay you through one of your stated payment options, be it by cheque, post-dated cheque, credit card, cash or dental credit card. In other words, although you and your team will have mapped out exactly what types of special arrangements are acceptable, they should not be communicated to the patient unless he or she queries you on them.

Let the accountability and responsibility for financial arrangements lie with the team member who makes your in-office collections – the financial secretary. If somebody else makes an arrangement with the patient, it is difficult for the financial secretary to accept responsibility for something that he or she didn't participate in. And be sure to choose this team member carefully. A financial secretary must have the refined verbal skills necessary to handle collections effectively, but without alienating the patient by making them feel guilty or negative.

In addition, while your practice's special financial arrangements should offer flexibility to your patients, they should do so in a way that poses no risk to you. They must be acceptable and in your comfort zone. Businesses don't prosper by offering services at no cost. And dentistry stands as one of the only professions that provides treatment without demanding immediate payment. As a result, many practices face the worst scenario possible – collection problems.

The Ever-Present Aggravation: Insurance

As if the accounts receivable battle isn't enough to contend with, dental insurance inherently poses more irritating hurdles.

Non-assignment practices have the least worries, since patients pay the dentist and then wait to be reimbursed by their respective insurance companies. However, patients frequently face cash-flow problems while waiting for their cheques to arrive. To alleviate this hardship, you could accept cheques that are post-dated four weeks from the day the services were rendered. By this time, the patient will most likely have received his or her cheque from the insurance company.

It's rather more complicated with assignment practices. Often, when the dentist collects from the insurance company, he or she isn't sure what the coverage is. But this uncertainty isn't communicated to the patient, and the dentist forwards the claims form to the insurance company saying a silent prayer that he or she will be reimbursed in full. If the claim is rejected, it becomes difficult to collect from the patient. By the same token, if the claim isn't rejected flat out, it's still difficult to collect a partial payment. (And are you going to bother chasing someone for \$5 or \$10?)

Fortunately, many of these problems can now be avoided. CDAnet, the electronic data interchange system developed by CDA and nine of Canada's provincial dental associations, is designed to allow dentists to send out claims, computer to computer, while the patient is still in the dental office. If the patient's insurance company is an "on-line" participant in the network, claims can be adjudicated in less than a minute, and the patient advised of the amount he or she must pay out of their own pocket immediately. If the insurer is a "batch" participant, claims are settled within 24 to 48 hours.

Regardless of how they communicate with the insurance companies, assignment practices must master the art of communication if they hope to avoid chronic collection problems. Articulate your policy to your patients, making it clear that while they will not be asked for payment upfront, they will be responsible for any outstanding amount that the insurance company doesn't cover. Yet even when patients are properly informed about their payment responsibilities, they can still walk out of your office with a misconception. Assignment practices have to work diligently at their collection strategy. If they don't, they may find that chasing patients – for both the large and the small sums not covered by the insurance com-

panies – will guarantee that an accounts receivable nightmare becomes a daily reality.

Entering the Abyss of Collections

When you've taken every preventative measure possible to curtail accounts from becoming delinquent, but your collections house still isn't in order, you have to shift gears. It's time to change your defensive strategy to an offensive one, to reflect the new nature of the battle.

Once an account becomes delinquent, and you've no choice but to enter a collection mode, you should be cognizant of the following: you can't afford to forego payment and you can't afford to lose patients. Therefore, the collection process must be handled in a delicate, organized and effective fashion.

Earlier, I emphasized informing patients of their financial obligations. By sticking to this golden rule, collections can be less cumbersome. Patients should never walk out of your practice without knowing what their responsibility is if they haven't paid you. By spelling it out on a computer-generated or manually-written statement – which you hand them before they leave the office – both parties will know what each expects from the other. For example, a statement could read: "Patient agrees to pay within 30 days." Get the patient to initial this, the simple act of putting pen to paper can reinforce the patient's commitment to meet the payment schedule. You should have a "tickle" in place to remind you to follow-up if the payment has not been received within 30 days.

The Telephone: the First Level of Collection Strategy

The best way to let a patient know that he or she has not lived up to his or her end of the bargain is the telephone. It should always be the first level of your collection strategy. If the telephone yields no results, send a friendly letter. Still no payment? Send another letter, written in a stern tone, outlining your collection strategy. If this doesn't jolt the patient into action, a third letter, indicating that you plan to take action, could elicit prompt payment. And don't be specific about what your next action will be, whether it involves a letter from your lawyer or passing the matter over to a collection agency.

Whatever you do, don't let collec-

tions drag on too long. You must have a process to track delinquent accounts, catching them just as they become delinquent. The prime time to collect is when an account has just passed the 30-day mark. Between 30 days overdue and 90 days overdue, there is still hope, but once an account is over 90 days past due, your chances of collecting, without employing a collection agency, are next to nil.

Remember that the ideal time and place to collect is in your office, when you have the patient standing in front

of you. The more payment options you have, the more likely you are to receive payment then and there. You can actually make your financial policy so flexible that patients will be all but cornered into paying on the spot.

However, the reality is that there will always be some patients who need financial arrangements to afford clinical treatment. If you follow the above strategy, though, you'll find that a balance – between the patient's need for flexible payments and your practice's need for cash flow – can be easily struck.

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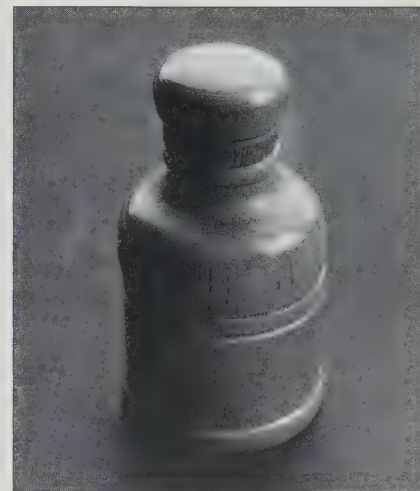
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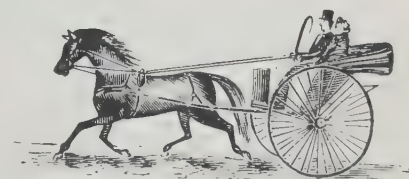
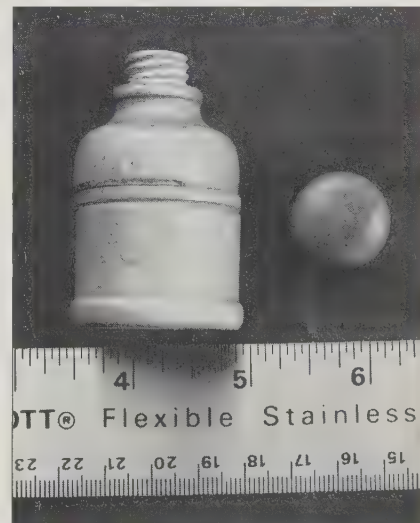
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Specialty Feature

Issues In The Amalgam Debate

Michael I. MacEntee, PhD, LDS(I), FRCD(C)
Philippe Mojon, DMD
Vancouver

ABSTRACT

This paper reviews the facts available on the biological effects of mercury released from amalgam restorations in teeth. There seems to be no doubt that mercuric vapor is released from restorations, but we do not know how much of this mercury is deposited in human tissues. There is no scientific evidence to support the belief that vapors from dental restorations either cause or exacerbate human diseases. Therefore, there is no clinical justification at present for replacing amalgam with other less durable or less predictable restorative materials.

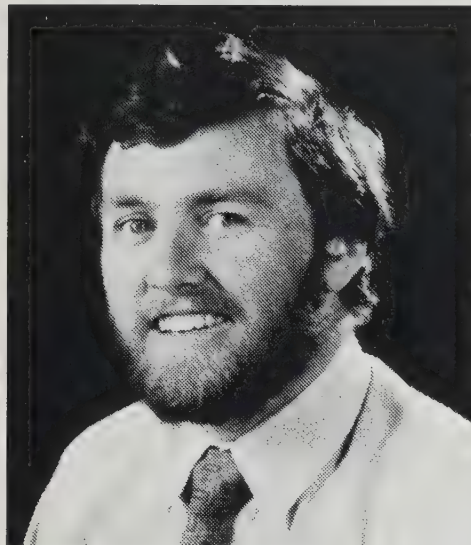
SOMMAIRE

Dans cet article, on révisé les faits touchant les conséquences biologiques du mercure qui se répand dans l'organisme à partir des restaurations dentaires à l'amalgame. Il semble n'y avoir aucun doute que ces restaurations libèrent des vapeurs de mercure, mais on ignore quelle quantité de mercure se dépose dans les tissus. Il n'y a aucune preuve scientifique appuyant la croyance que les vapeurs de mercure provenant des restaurations dentaires causent des maladies ou en aggravent. Aussi, à l'heure actuelle, rien n'indique qu'il soit mieux de remplacer l'amalgame par des matériaux moins durables et moins prévisibles.

"All substances are poisons; there is none which is not a poison: the right dose differentiates a poison from a remedy" (Paracelsus 16th Century).

Current Use Of Amalgam

Amalgam restorations have been used widely in dentistry since early in the last century, and they provide a significant part of the mercury that is placed in direct contact with human tissues. In fact, approximately three per cent of the total mercury con-

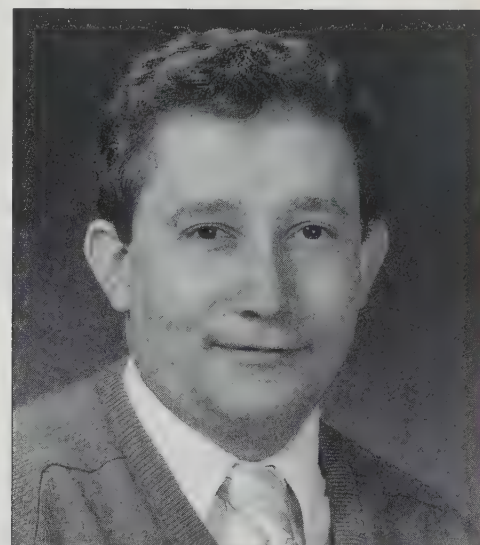


Dr. M. I. MacEntee

sumed in industrial countries is used to restore teeth.¹ In England and Wales during 1983, about 25-million amalgam restorations were placed, while in the U.S.A., about 160-million amalgam restorations are placed annually, accounting for at least three-quarters of all single tooth restorations.² The popularity of amalgam has grown over at least 150 years of clinical experience, based on the fact that it has been the cheapest, most predictable, and most widely used material available for restoring teeth. The high (50 per cent) content of mercury in this amalgam has been the cause of grave concern and intensive research, but it is still the measure against which other dental restorative compounds are tested.

The Disturbing Forms Of Mercury

Three forms of mercury are responsible for most of the disorders associated with exposure to the metal: the inorganic elemental monatomic gas or mercuric vapor; the inorganic divalent mercuric salts; and methyl mercury, which is the most commonly encountered organic form. Each is deposited and excreted separately in the body, and associated with a distinct mechanism of



Dr. Philippe Mojon

damaging tissue. The U.S. Environmental Protection Agency³ (EPA) has estimated that the average amounts of mercury deposited each day in adults who are not normally exposed to it at work, are: 153 nanograms of mercury vapor; 2,000 ng of mercuric salts from foods other than fish, along with five ng of mercuric salts from drinking water; and 3,666 ng of organomercurials, which are predominantly methyl mercury from fish.³ The World Health Organization (WHO)⁴ has established, quite arbitrarily, a limit of 25 micrograms per cubic metre of mercury for occupational exposure, but the daily dose of inhaled mercury could vary between 150 and 300 µg per day, depending upon the volume of air inhaled with each breath (one µg = 1,000 ng). This limit, overall, should be considered highly provisional, because many of the factors that influence the uptake of mercury in the body were not considered in the estimates.⁵

Mercury From Dental Amalgam

There is no doubt that amalgam restorations release mercuric vapor, but there are many unanswered questions about the quantity of mercury released,



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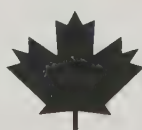
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and about the deposits and toxicity of mercury in the body.^{6,7,8,9,10}

The Quantity Released

The usual method of collecting mercuric vapor from dental fillings is to draw the vapor from the mouth, and to measure the quantity with an instrument. There is much variation in the technique, and there is substantial disagreement about the interpretation of the results (Table I). One group of investigators, for example, suggests that the amount of mercuric vapor measured is independent of the volume of air taken by the instrument.^{10,11,14}

Others¹⁵ believe that the movement of air over the teeth will dilute the mercury coming from the fillings, and that the results must be interpreted accordingly to estimate accurately the quantity of vapor released.

There are several other confounding factors that influence the quantity of mercury released. Chewing and tooth brushing increase the level of mercuric vapor in the mouth,^{6,7,8} while larger quantities can be detected when the restorations are inserted and polished.^{16,17} New fillings are less stable than aged restorations (Table 2), and bruxers will unsettle mercuric compounds more readily than relaxed individuals.^{6,9,19}

The removal of old restorations from teeth may be a cause for greater practical concern than the presence of amalgam fillings in the mouth. Before amalgam restorations were removed, Huggins²⁰ measured 0.005 ng of mercury per millilitre of urine from one subject, and 0.015 ng Hg/mL from another, while immediately after the procedure, 0.095 ng Hg/mL and 0.14 ng Hg/mL respectively were measured. Snapp et al.,²¹ from a similar investigation, reported that there was an average increase of 1.5 ng Hg/mL in the blood of 10 volunteers after removing amalgams.

Deposits of Mercury in the Body

The absorption and deposition of mercury in mammals depends upon the dose and the duration of exposure to the metal.²² About seven per cent of mercuric salts, and 90 per cent of ingested methyl mercury, are absorbed in the gut, whereas 80 per cent of inhaled vapor passes through the lungs into the blood.

The absorbed metal is eliminated

Table I:

Reports on the quantity of mercury vapor released from dental amalgam and inhaled in humans.

Report	Micrograms of Mercury Per Day
Mackert, 1987 ¹⁰	1.2
Berglund, 1990 ¹¹	1.7
Aronsson et al, 1989 ¹²	9.8
Vimy and Lorscheider, 1990 ¹³	10.0

Table II:

The rate of mercury vapor released after 15 minutes of chewing on amalgam fillings aged for various periods of time.¹⁸

Age of Fillings	Nanograms of Mercury Released in 10 Breaths
Control (no fillings)	1 - 6
1 - 2 Years	17 - 76
1 - 2 Weeks	172 - 224

Table III:

Reports on the concentration of mercury in the tissues of animals with radioactive isotopes imbedded in dental amalgam restorations.

Animal	Concentration in Tissues				
	ng/g				
	Blood	Urine	Kidney	Brain	Pituitary
Sheep ³²	9.0	4.7	7,438.0	3.5	44.4
Monkey ³³	5.8	17.8	3,053.3	12.6	83.6

from the body primarily in feces and to a lesser extent in urine. Methyl mercury is secreted in the bile, but part of this mercury is reabsorbed by the intestine. In the intestine, bacteria can degrade methyl mercury to inorganic salts, which are removed eventually in the feces, although bacteria can change the salt to methyl mercury.^{23,24,25}

The inorganic salts lodge principally in the kidneys, mercuric vapor is particularly drawn to the brain, while methyl mercury is distributed more generally around the body, and even to

the placenta.^{26,27} Estimates of the time required to remove mercuric deposits from the body are vague, ranging from a half-life of three to 70 days.^{21,26}

The fate of the mercuric vapor remains the focus of a vigorous controversy. It may be released directly into the mouth and inhaled, although we do not know how much air passes from the mouth to the lungs. Consequently, estimates of the mercuric vapor reaching the lungs are quite speculative.^{10,13,15,28} Berglund²⁸ suggests that it is contained within the saliva and swallowed, be-

Table IV:

Report on the deposition of mercury in the body of humans³⁴

Subjects	Concentration in tissues ng/g								
	Kidney			Pituitary			Brain		
	n	mean	(range)	n	mean	(range)	n	mean	(range)
Dentists	3	1,533	(945-2,110)	7	1,645	(135-4,040)	7	67.1	(4-300)
Controls	12	273.3	(21- 810)	23	107.5	(6-1,170)	20	11.1	(2-29)

cause teeth are constantly under saliva, and the vapor diffuses slowly in an aqueous system.

A large proportion of the mercuric vapor will pass into the blood if it reaches the lungs, and there is little doubt that amalgam restorations in the mouth increase the level of mercury in the blood. Nonetheless, reports on the association between the number of restored surfaces and the blood levels of mercury are inconsistent. Most of it oxidizes rapidly to a salt, and probably goes to the kidneys, although some may pass the blood-brain barrier.⁵ About half of the mercury that arrives in the kidneys is excreted in the urine.³⁰ Experimental investigations show wide variations and large daily fluctuations in the levels of mercury found in the urine.²²

Dentists should be ideal subjects for investigating deposits of this element. Indeed, urine taken from a large number of dentists in the U.S.A. found that over half (60 per cent) of them had more than 10 ng Hg/mL, but that only a small proportion (five per cent) had more than 50 ng Hg/mL.³¹ This study also found that the amount of mercury in the urine of dentists in general practice was higher than in the urine of orthodontists, and that the amount was significantly associated with the number of working hours.

Attempts have been made to determine how much mercury is deposited in the brain and in other regulatory organs of animals and humans, but the results vary considerably (Tables III and IV). Several studies have been performed on sheep because they swallow, regurgitate and chew food continuously, and thus provide the worst clinical situation possible.³² Not only would their continuous chewing dislodge the mercury from dental fillings, but the rumination would increase the absorption of mercury from the gut. A recent study on sheep by Boyd et al³⁵ in Calgary suggests that amalgam fillings may have had an

adverse effect on the renal tubules of the animals. Nevertheless, the Calgary group did not find histological evidence of kidney damage in the sheep, and they concluded that the reduced rate of inulin clearance was due to "nondefined mechanisms."

Biological indicators of mercuric deposits in different parts of the human body are still missing, except for the urinary level of mercury which is considered representative of the accumulation in the kidneys.²² Mercury can pass from the blood to the brain, but the possibility of estimating the amount and the rate of deposition from the quantity of vapor produced by fillings is still under discussion. In fact, if we accept the arguments of Lorscheider and Vimy,¹⁵ the daily exposure of 10 µg of mercuric vapor from amalgam in some mouths may be twice the quantity absorbed in one day by the average U.S. citizen. In contrast, according to several independent sources,^{21,28,29,36} the exposure may be only one to two µg of vapor per day, or a third of the "normal environmental" daily dose. In any event, the values are small compared to the 150 - 300 µg that can be tolerated by humans each day without ill effects.⁴ Despite this reassurance, there remains the possibility that mercury, even in very small amounts, can cause problems in humans.

Pathoses Caused By Mercury

Prolonged exposure to mercuric chloride can disturb the immune system to interfere with glomerular filtration in the kidney, and acute renal failure can result from the ingestion of one gram of the salt. An overdose of mercuric vapor usually presents clinically as gingivitis, tremors, and erethism. This last sign is portrayed most notoriously in the peculiarities of the "Mad Hatter" in Lewis Carroll's *Alice in Wonderland*. Hat makers in the last century used mercuric salts to stiffen material for hats. Methyl

mercury disturbs the nervous system after a latent period of weeks or months to produce paresthesia and other sensory or motor upsets.^{37,38} It is important to realize, however, that mercury is not alone in causing these symptoms. Other elements, such as aluminum, lead, tin, and cadmium, can produce similar clinical effects.³⁸

Various attempts have been made to relate physical signs with levels of mercury in the blood or urine. One study compared the level of mercury in the blood of four Danish dentists (range 1.2 - 19.2 ng/mL) with two subjects who were not knowingly exposed to mercury in their place of work (range 1.1 - 4.6 ng/mL),³⁹ but it found that the extra exposure to mercury had no effect on the dentists. Again, on the positive side of the debate, there was a study in Sweden on the outcome of pregnancy in dentists, dental assistants, and dental technicians that failed to find any association between the rates of spontaneous abortions, perinatal survival, or birth weights, and an occupational exposure to mercury.⁴⁰ Molin et al⁴¹ compared a group of patients before and after the removal of amalgam fillings, and concluded that there was no improvement in general health after one year that could be attributed to the removal of amalgam, nor was there evidence of kidney problems.

The optimistic reports contrast with the results of an investigation of workers who were exposed to mercury where they work.⁴² Subtle changes in motor function were found in the workers with 10 to 20 ng Hg/mL of blood - concentrations that are still substantially (X15) higher than levels estimated by Snapp et al²¹ from amalgam fillings. More recently Piikivi et al⁴³ found that the electroencephalograms of workers exposed to mercuric vapor were altered even when the concentration of mercury in the air was around 25 µg/m³. Ngim and Devathanan⁴⁴ found a significant

association between Parkinson's disease and mercury in the blood, but they did not have a large number of subjects with natural teeth, so they were unable to consider the effect of dental restorations.

Allergies to mercury have been detected, but, like allergies to many other materials used in dentistry, e.g. methylmethacrylate, they are very uncommon.^{45,46} Moreover, when an allergy does arise it is cell-mediated, so it produces a mucositis or a cheilitis rather than a neurological disturbance.⁴⁷ A patch-test of 0.1 per cent mercuric chloride on dental students found that two per cent of the first year students, in contrast to 11 per cent of the senior students, were hypersensitive to the salt.⁴⁸

So, clearly, there is a positive association between professional exposure to mercury and a heightened physiological response to it, although the significance of the response is still a mystery. We think that it is particularly important to note that there have been no verified reports, other than a few anecdotal testimonials, of clinical damage to human organs that can be attributed to mercury released from dental amalgam.

Epidemiology Of Amalgam Toxicity

Risk is defined as the likelihood of injury as a result of exposure, and usually it is expressed as the expected ratio between the number of subjects who experience an adverse reaction in a given time to the number of subjects at risk.⁴⁹

So, now we are close to the core of the debate. There is no doubt, as we have shown above, that mercury does vaporize from amalgam restorations, that it does lodge in human tissues, that it can damage human tissues, and that some individuals are allergic to it. Therefore, we should look at the prevalence of mercury toxicity in the general population.

Unfortunately, there is very little information available on this question. Results of a study conducted among hypersensitive patients with a variety of allergies, who were referred to dermatologists in the U.S. and Canada, found that 5.4 per cent of them had a contact hypersensitivity to mercury.⁵⁰ It is important to appreciate, however, that this report offers no information on the prevalence of mercury hypersensitivity in the population at large, as some

authors have inferred. The fact that an allergy to mercury was diagnosed in a small proportion of the patients who went for treatment to dermatologists should cause no more alarm than a proclamation attesting to the high prevalence of psychiatric disorders among the residents of a psychiatric hospital.

At this point, we simply do not know how many people are hypersensitive to mercury, although considering the vast number of people having amalgam restorations without obvious ill-effects, it is obvious that hypersensitivity to mercury is an extremely unusual finding, and that the risk-ratio in the population is low.⁵¹

Alternative Restorative Materials

Are there other materials that can be used in place of amalgam to restore teeth with less risk of a hypersensitive response? Noble alloys and ceramic materials are relatively inert, but not completely without risk.⁵⁶ They are difficult to use in the mouth, and if they are inserted carelessly they will cause damage to the surrounding tissues. We know also that elements from a wide variety of dental alloys are distributed around the body shortly after they are placed in the mouth.⁵² There is mounting evidence that dentists, dental assistants, and patients can be sensitized to the components of composite resins,⁵³ and we know little or nothing about the long-term impact they may have on human tissues.⁵⁴ Although composite resins may prove to be a satisfactory replacement for amalgam in the future, we know that the products currently available do not withstand the test of time in posterior teeth with anything like the predictability of an amalgam restoration.

Summary

1. The concentration of mercury is higher in dentists than in other segments of the population.

2. Reports on the levels of mercury found in human subjects with amalgam compared to subjects without amalgam are inconsistent.

3. Individual variation in the uptake and elimination of mercury is substantial in humans.

4. The minimal level of mercury that impairs health is unknown.

5. There is no evidence that specific diseases in humans are caused by mercury from amalgam fillings.

In conclusion, we would like to repeat the observations of others who have reviewed the research relating to this controversy, and to report that we found no compelling evidence that amalgam restorations pose an unusual risk to the health of the population. It remains the most predictable material available for restoring minor structural defects in teeth. Nevertheless the research continues and many questions remain unanswered. It is prudent at this point to remember that most of the difficulties in toxicology are political, psychological, and sociological, rather than scientific.⁵⁵ Enwonwu⁵ concluded a similar review of this subject with the observation that the English legal system would find dental amalgam innocent until there is further proof of guilt, whereas the French system would consider the material guilty until further proof of innocence. It is fitting, therefore, that Canadians should appear so prominently in this affair.

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References

1. Korrington, P., and Hagel, P. Proceedings. *Industrial Symposium on the Problems of Contamination of Man and His Environment by Mercury and Cadmium*. Luxembourg 3-5 p. 279. C.E.C., Luxembourg, July 1983.
2. Eley, B.M. and Cox, S.W. Mercury from dental amalgam fillings in patients. *Brit Dent J* 163(10):221-226, 1987.
3. EPA. Environmental Protection Agency. *Mercury Health Effects Update: Health Issue Assessment. Final Report*. EPA-600/18-84-019F. Office of Health and Environmental Assessment. Washington, D.C., 1984.
4. WHO. *Recommended health-based limits in occupational exposure to heavy metals. Technical Report Series 647*. Geneva: World Health Organization, pp. 1-116, 1980.
5. Enwonwu, C.O. Potential health hazard of use of mercury in dentistry: Critical review of the literature. *Environ Res* 42:257-274, 1987.
6. Svare, C.W., Peterson, L.C., Reinhardt, J.W., et al. The effect of dental amalgams on mercury levels in expired air. *J Dent Res* 60(9):1,668-1,671, 1981.
7. Abraham J.E., Svare, C.W., and Frank, C.W. The effect of dental amalgam restorations on blood mercury levels. *J Dent Res* 63(1):71-73, 1984.
8. Patterson, J.E., Weissberg, B.G., and Dennison, P.J. Mercury in human breath from dental amalgams. *Bulletin of Environmental*

Contamination and Toxicology 34:459-468, 1985.

9. Vimy, M.J. and Lorscheider, F.L. Intra-oral air mercury released from dental amalgam. *J Dent Res* 64:1,069-1,071, 1985a.

10. Mackert, J.R. Factors affecting estimation of dental amalgam mercury exposure from measurements of mercury vapor levels in intra-oral and expired air. *J Dent Res* 66:1,775-1,780, 1987.

11. Berglund, A. Estimation by a 24-hour study of the daily dose of intra-oral mercury vapor inhaled after release from dental amalgam. *J Dent Res* 69(10):1,645-1,651, 1990.

12. Aronsson A.M., Lind B., Nylander M., and Nordberg M. Dental amalgam and mercury. *Biol Metals* 2:25-30, 1989.

13. Vimy, M.J., and Lorscheider, F.L. Dental amalgam mercury daily dose estimated from intra-oral vapor measurements: A predictor of mercury accumulation in human tissues. *J Trace Elem Exp Med* 3:111-123, 1990.

14. Olsson, S. P. and Bergman, M. Letter to the editor. *J Dent Res* 66:1,288-1,289, 1987.

15. Lorscheider, F.L. and Vimy M.J. Letter to the editor. *J Dent Res* 70:233, 1991.

16. Reinhardt, J., Kai Chiu Chan, Schuelein, T.M. Mercury vaporization during amalgam removal. *J Prosthet Dent* 50(1):62-64, 1983.

17. Haikel, Y., Gasser, P., Salek, P., Voegel, J.C. Exposure to mercury vapor during setting, removing, and polishing amalgam restorations. *Biomed Mat Res* 24:1,551-1,558, 1990.

18. Vimy, M.J. and Lorscheider, F.L. Serial measurements of intraoral air mercury: Estimation of daily dose from dental amalgam. *J Dent Res* 64(8):1,072-1,075, 1985b.

19. Gay, D.D., Cox, R.D., Reinhardt, J.W. Chewing releases mercury from fillings. *Lancet* 1:985-986, 1979.

20. Huggins, H.A. Mercury: A factor in mental disease? *J Orthomol Psychiatry* 11: 3-16, 1982.

21. Snapp, K.R., Boyer, D.B., Peterson, L.C., Svare, C.W. The contribution of dental amalgam to mercury in blood. *J Dent Res* 68(5):780-785, 1989.

22. Clarkson, T.W. Mercury. *Annu Rev Public Health* 4:375-380, 1983.

23. Edwards, T. and McBride, B.C. Bio-synthesis and degradation of methyl-mercury in human feces. *Nature* 253: 462-464, 1975.

24. Heintze, U., Edwardson, S., and Derand, T. Methylation of mercury from dental amalgam and mercuric chloride by oral streptococci *in vitro*. *Scand J Dent Res* 91:150-152, 1983.

25. Summers, A.O. Organization expres-sion, and evolution of genes for mercury resistance. *Annu Rev Microbiol* 40:607-634, 1986.

26. Craig, R.C. Biocompatibility of mercury derivatives. *Dent Mater* 2:91-96, 1986.

27. Vimy, M.J., Takahashi, Y., Lorscheider, F.L. Maternal-fetal distribution of mercury (^{203}Hg) released from dental amalgam fillings. *American J Physiol* 5:258-264, 1990.

28. Mackert, J.R. Letter to the editor. *J Dent Res* 70:234-237, 1991.

29. Berglund, A. Letter to the editor. *J Dent Res* 70:233-234, 1991.

30. Cooper, D.W. Letter to the Editor. *Amer Indus Hygiene Assoc J* 47:165-166, 1986.

31. Nalaway, C., Sakaguchi, R., Mitchell, E., Muller, T., Ayer, W.A., and Hefferen, J.J. Urinary mercury levels in U.S. dentists. 1975-83: Review of health assessment program. *JADA* 111:37-42, 1985.

32. Hahn, L.J., Kloiber, R., Vimy, M.J., Takalashi, Y., and Lorscheider, F.L. Dental "Silver" tooth fillings: a source of mercury exposure revealed by whole-body image scan and tissue analysis. *FASEB J* 3:2,641-2,646, 1983.

33. Hahn, L.J., Kloiber, R., Leininger, R.W., Vimy, M.J., and Lorscheider, F.L. whole-body imaging of the distribution of mercury released from dental fillings into monkey tissues. *FASEB J* 4:3,256-3,260, 1990.

34. Nylander, M., Friberg, L., Eggleston, D., and Bjorkman, L. Mercury accumulation in tissues from dental staff and controls in relation to exposure. *Swedish Dental Journal* 13:235-243, 1989.

35. Boyd, N.D., Benediktsson, H., Vimy, M.J., Hooper, D.E., and Lorscheider, F.L. Mercury from dental "silver" tooth fillings impairs sheep kidney function. *Amer J Physiol* 261 (Regulatory Integrative Comp. Physiol 30): R1010-1014, 1991.

36. Mackert, J.R. Dental amalgam and mercury. *JADA* (Special Report) 122(9): 54-61, 1991.

37. Nordberg, G.F. Factors influencing metabolism and toxicity of metals: A consensus report by the task group on metal interactions. *Envir Health Perspect* 25:3-1, 1978.

38. Weiss, B. Behavior as a sentry of metal toxicity. In: *Trace Metals: Exposure and Health Effects*. Ed. E DiFerrante, Pergamon, Oxford. pp 185-198, 1979.

39. Moller-Madsen, B., Hansen, J.C., and Kragstrup, J. Mercury concentrations in blood from Danish dentists. *Scand J Dent Res* 96:56-59, 1988.

40. Ericson, A. and Kallen, B. Pregnancy outcome in women working as dentists, dental assistants or dental technicians. *Int Arch Occupational Environmental Health* 61:329-333, 1989.

41. Molin, M., Bergman, B., Marklund, S.L., Schutz, S., and Skerfving S. Mercury, selenium, and glutathione peroxidase before and after amalgam removal in man. *Acta Odontol Scand* 48:189-202, 1990.

42. Roels, H., Lauwerys, R., Buchet, J.P., Bernard, A., Oversteyus, M., and Gaussin, J. Comparison of renal function and psychomotor performance in workers exposed to elemental mercury. *Int Arch Occup Environ Hlth* 50:273-281, 1982.

43. Piikivi, L. and Tolonen, U. EEG findings in chlor-alkali workers subjected to low long-term exposure to mercury vapor. *Brit J Industr Med* 46:370-375, 1989.

44. Ngim, C-H. and Devathanan, G. Epidemiologic study on the association between body burden mercury level and idiopathic Parkinson's disease. *Neuro-epidemiol* 8:128-141, 1989.

45. Bauer, J.G. and First, H.A. The toxicity of

mercury in dental amalgam. *J Californian Dent Assoc* 10:47-61, 1982.

46. Duxbury, A.J., Watts, D.C., and Ead, R.D. Allergy to dental amalgam. *Brit Dent J* 152:344-345, 1982.

47. Fisher, A.A. "Response" (Hypersensitivity to mercury from dental amalgams). *J Amer Acad Dermatol* 12: 878-879, 1985.

48. White, R.R. and Brandt, R.L. Development of mercury hypersensitivity among dental students. *JADA* 92:1,204-1,207, 1976.

49. WHO. World Health Organization. *Principles Governing Consumer Safety in Relation to Pesticide Residues. Techn Rep No. 240*. WHO Geneva, 1961.

50. Contact Dermatitis Group. Epidemiology of contact dermatitis in North America: 1972. *Arch Dermatol* 108:537-540, 1973.

51. Mackert, J.R., Leffell, M.S., Wagner, D.A. and Powell, B.J. Lymphocyte levels in subjects with and without amalgam restorations. *JADA* 122:49-53, 1991.

52. Brune, D. Metal release from dental biomaterials. *Biomater* 7:163-175, 1985.

53. Mjor, I.A. and Wennberg, A. Biocompatibility considerations of composite resins. In: *Posterior Composite Resin Dental Restorative Materials*. ed G. Vanherle and D.C. Smith. Peter Szulc Publishing Co. The Netherlands. pp:83-90, 1985.

54. Li, Y., Noblitt, A.J., Dunipace, A.J., and Stookey, G.K. Evaluation of mutagenicity of restorative dental materials using the Ames/Salmonella Test. *J Dent Res* 69:1,188-1,192, 1990.

55. Chenoweth, M.B. Perspectives in toxicology. *Annu Rev Pharmacol Toxicol* 25:33-40, 1985.

Season's Greetings
&
Best Wishes For
The New Year



Comparison of two popular methods for removal and killing of bacteria from dentures

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ABSTRACT

A study was undertaken to compare the efficacy of a soaking solution (Efferdent Extra-Strength Denture Cleanser Tablets) to mechanical cleaning with a denture paste (Advanced Formula Dentu-Creme Denture Cleaning Paste) to remove and kill plaque bacteria from removable dentures. The study was conducted in a randomized, four-way crossover fashion with 18 subjects. At each clinic visit, subjects were randomized to one of four treatment regimens: 1) no treatment; 2) brushing with denture paste; 3) soaking in Efferdent; 4) brushing followed by soaking in Efferdent. Microbiological sampling for plaque bacteria was made before and after each treatment. Aliquot samples of 10-fold serial dilutions were plated on supplemented Schaedler Agar (for total anaerobes) and on CVE agar (for fusobacteria). Analysis of covariance was performed on the log₁₀ transformed scores at posttreatment using the pre-treatment scores as covariates. Significant treatment effects were: $F(3,41) = 81.60$, $p < 0.001$ for anaerobes and $F(3,50) = 104.38$, $p < 0.001$ for fusobacteria. Pairwise comparisons using Tukey hsd post hoc tests showed that for total anaerobes, treatments 1 and 2 yielded higher scores than treatments 3 and 4. For fusobacteria, treatment 1 > 2 > 3 or 4; no difference between treatments 3 and 4. The results demonstrated the superior performance of Efferdent over Dentu-Creme.

SOMMAIRE

On a effectué une étude visant à comparer l'efficacité d'une solution de trempage (nettoyant à prothèse Efferdent, formule ultra-puissante) à celle d'un nettoyage mécanique avec une pâte nettoyante (Dentu-Creme, formule avancée) pour enlever et détruire la plaque microbienne s'attachant aux prothèses amovibles. Il s'est agi d'une

étude randomisée et croisée à quatre inconnues. Elle a porté sur 18 sujets qui, à chaque visite, ont reçu l'un des quatre traitements suivants: 1) aucun traitement, 2) brossage avec la pâte nettoyante, 3) trempage dans la solution nettoyante, 4) brossage et trempage dans la solution nettoyante. Avant et après chaque traitement, on a fait des prélèvements microbiologiques de plaque microbienne qu'on a dilués en parties égales dans de l'agar-agar afin de déterminer le nombre des anaérobies et des bacilles fusiformes. En tenant compte des covariables, on a obtenu des résultats significatifs: $F(3,41) = 81.60$, $p < 0.001$ pour les anaérobies et $F(3,50) = 104.38$, $p < 0.001$ pour les bacilles fusiformes. En comparant les moyennes appariées à l'aide du test Tukey, on a découvert que, pour les anaérobies, les traitements 1 et 2 donnaient plus de points que les traitements 3 et 4 et que, pour les bacilles fusiformes, il n'y avait aucune différence entre les traitements 3 et 4 qui l'emportaient sur les deux premiers. On en a conclu qu'Efferdent est supérieur à Dentu-Creme.

Introduction

The two most commonly used methods for the cleansing of dentures are: a) brushing with an abrasive paste, and; b) immersion in a chemical soak. Both methods, when performed correctly, have been shown to remove accumulated dental plaque. Dental plaque is not only esthetically unappealing, but also plays a role in the development of denture stomatitis, an inflammation of the oral tissues that are in direct contact with the removable denture,¹ and of halitosis.² Although Dills et al.³ had compared the antimicrobial capability of these two popular denture cleansing methods, the materials used for testing were not Canadian formulations. In this study, Canadian over-the-counter ma-

terials were used in a direct comparison of these two methods to remove or kill bacteria from full maxillary dentures.

Materials and Methods

Test Materials

The abrasive denture paste used was Advanced Formula Dentu-Creme Denture Cleaning Paste (fresh spearmint flavor), a product of Block Drug (Canada) Ltd., Toronto, Ontario (Lot # A209). The denture cleanser soak solution was Efferdent Extra Strength Denture Cleanser Tablets (Formula W3215-210) produced by Warner-Lambert Canada Inc., Scarborough, Ontario (Lot # (L)99916). Chemical denture soak products generally contain oxidizing antimicrobial agents such as perborates.

Clinical Study Design

The study was conducted in a randomized, four-way double-blind crossover fashion. At each clinic visit, subjects were randomly assigned to one of four treatment regimens and instructed to clean their dentures with the specified treatment. Microbiological sampling was conducted before and after each treatment. Treatment regimens occurred during two successive weeks until completion of the study.

Selection of Subjects

A total of 18 evaluable subjects were recruited for the study. Subjects were healthy male and female adult volunteers who were at least 18 years of age and had full maxillary dentures and healthy oral mucosa with no mucosal inflammation under prostheses. The dentures had intact surfaces, no treatment relines, and no soft liners. The subjects were not taking systemic antibiotics or steroidal anti-inflammatory drugs. All subjects had signed an informed consent form before participation in the study.

Clinical Procedures

Prior to beginning each cycle of the study, each prosthesis was thoroughly cleaned by brushing with a denture paste, followed by ultrasonic cleaning carried out by the dental hygienist. The subjects were then directed to refrain from all denture oral hygiene for 48 hours and were to wear their dentures continuously prior to each treatment. On the treatment day, prior to treatment, the left-hand tissue-bearing side of the denture was swabbed thoroughly and carefully with a polyester swab pre-moistened with reduced transport fluid (RTF).⁴ The swab was then placed in RTF for baseline microbiological sampling and the subjects were instructed to clean their dentures by one of the following treatments, assigned by random code: 1) no treatment; 2) brushing with the denture paste for 30 seconds in the subject's usual manner; 3) soaking in Efferdent for 12 minutes in warm water (45°C), or; 4) brushing followed by soaking in Efferdent as in treatments 2 and 3 above.

After cleansing, the dentures were rinsed thoroughly in tepid tap water to prevent carryover of active ingredients into the microbiological culture media. Culture swabs of the right-hand tissue-bearing side of the dentures were then made, as before, and the swabs were placed in RTF for microbiological evaluation. The prostheses were then recleaned by the dental hygienist, by brushing them with a paste followed by ultrasonic cleaning, before being returned to the subjects for the next clinic visit.

Fig. 1. Mean CFU's of Total Anaerobes

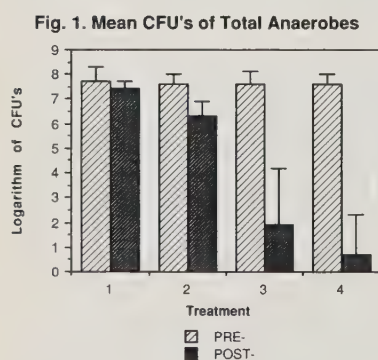


Figure 1. Recovery of colony-forming units (log₁₀ transformed) of total anaerobes on supplemented Schaedler blood agar medium before and after treatment.

TABLE I:

Mean colony-forming units recovered from full maxillary denture swabs (log₁₀ transformed)

Treatment	CVE medium (Fusobacteria)				SBA medium (Total anaerobes)			
	Pre-	SD	Post-	SD	Pre-	SD	Post-	SD
1	3.68	0.85	3.63	0.74	7.74	0.59	7.41	0.29
2	4.27	0.96	2.74	1.22	7.60	0.42	6.35	0.57
3	4.32	1.08	-0.08	0.64	7.60	0.52	1.91	2.26
4	3.86	0.82	-0.12	0.48	7.60	0.44	0.71	1.59

*1 = no treatment; 2 = brushing with denture paste for 30 seconds; 3 = soaking with Efferdent for 12 minutes in warm water; 4 = brushing followed by soaking as in 2 and 3.

Microbiological Procedures

The swabs collected in RTF were immediately placed in an anaerobic chamber (85 per cent N₂, 10 per cent H₂, and five per cent CO₂), and left for no more than two hours before completion of dilution.

In the anaerobic chamber, each sample was vortexed vigorously for 20 seconds to remove the plaque from the swab. Each plaque suspension was then serially and aseptically diluted 10-fold in sterile RTF through 10⁻¹⁰ before removal from the chamber.

On the bench top, aliquots of 0.5 millilitres of the dilutions were plated in duplicate on to Schaedler Agar medium

supplemented with five per cent defibrinated sheep blood and vitamin K (SBA) (purchased from BBL Microbiology Systems, Cockeysville, MD) and Crystal Violet-Erythromycin (CVE) agar medium. SBA is a rich non-selective medium and has been found to support the growth of many fastidious facultative and obligate anaerobic bacteria. It was used for the total viable count of culturable anaerobic (both facultative and obligate) plaque bacteria. CVE agar is a selective medium and was used for determining the viable count of fusobacteria.⁵

The medium plates, with inocula spread-plated using sterile glass spreaders, were incubated in the anaerobic chamber for 72 hours at 37°C prior to colony-forming unit (CFU) determination.

Fig. 2. Mean CFU's of Fusobacteria

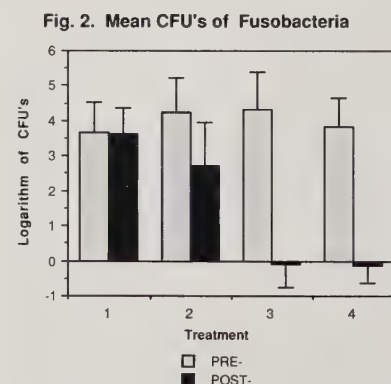


Figure 2. Recovery of colony-forming units (log₁₀ transformed) of fusobacteria on crystal violet-erythromycin agar medium before and after treatment.

Results and Discussion

The mean CFU's of facultative and obligate anaerobic bacteria recovered from plaque suspensions of vortexed swabs on SBA medium, before and after treatment, are shown in Table I. Also shown are the mean CFU's of fusobacteria recovered from the same suspensions on CVE agar medium. Bacteria of *Fusobacterium* spp. are profuse producers of volatile sulphides in the oral cavity;⁶ such sulphides are responsible for the objectionable odor of bad breath.²

Analysis of covariance was performed on the log₁₀ transformed scores of CFU's at posttreatment using the pre-treatment scores (also log₁₀ transformed) as covariates. Both analyses

(of log₁₀ transformed CFU scores on SBA and on CVE media) yielded significant treatment effects: $F(3,41) = 81.6$, $p < 0.001$ for SBA medium; $F(3,50) = 104.38$, $p < 0.001$ for CVE medium. Correction of heterogeneity of covariance using Greenhouse-Geisser df maintained significance at $p < 0.001$.

Pairwise comparisons using Tukey hsd post hoc tests showed that for SBA, treatment 1 (no treatment) and treatment 2 (brushing only with denture paste) yielded higher scores (more CFU's) than treatment 3 (soaking in Efferdent) and treatment 4 (brushing and soaking). There was no significant difference between treatments 1 and 2 or between treatments 3 and 4 (Fig. 1). Fisher's Protected Least Significant Difference (LSD) Test showed treatments 1 and 2 > treatment 3 > treatment 4 in scores; that is, treatment 4 was marginally better than treatment 3.

On CVE medium, post hoc tests (Tukey hsd or LSD) showed treatment 1 > treatment 2 > treatments 3 or 4 (in scores of CFU's) and no difference between treatments 3 and 4 (Fig. 2).

Thus, the analyses of covariance cited above show that brushing alone with a denture abrasive was not significantly better than no treatment in the removal of total cultivable facultative and obligate anaerobic bacteria. This was rather surprising since the mechanical action of brushing with the abrasive was expected to remove large numbers of plaque bacteria. However, this observation was substantiated by the results of Dills et al.,³ who also found that brushing alone did not result in a significantly lower recovery of organisms compared with the no-treatment group of samples on SBA medium. However, we found that brushing alone with a denture abrasive was more effective than no treatment in the reduction of odor-causing fusobacteria.

Both soaking (treatment 3) and the combined treatment (treatment 4) removed significantly more facultative and obligate anaerobic bacteria as well as more fusobacteria than either brushing alone or with no treatment. The combined treatment was not significantly better than the soaking alone for removing odor-causing fusobacteria.

Brushing alone with a denture paste was relatively poor compared with the more superior performance of a denture cleanser soak in killing and removing denture plaque bacteria. Coupling this finding to the lack of manual dexterity among many elderly individuals, brush-

ing alone with a denture abrasive is not recommended for the maintenance of good denture hygiene.

Even though chemical soaking has been shown to be equal in performance to the combined treatment (chemical soaking and brushing with a denture paste) in killing and removing fusobacteria, the combined treatment was marginally better in the removal of total facultative and anaerobic bacteria. It is apparent that the combined treatment removes residual food and other undesirable materials as well. Therefore for complete denture hygiene, the combined treatment is advocated.

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Dr. Chan is an associate professor, Dr. Barolet is a professor and the dean, Dr. Amsel is a lecturer, and Dr. Siboo is an associate professor at the faculty of dentistry of McGill University, Montreal. The remaining authors are non-academic staff members.

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References

1. Abelson, D.C. Denture plaque and denture cleansers: review of the literature. *Geriodontics* 1:202-206, 1985.
2. Tonzetich, J. Production of oral malodor: a review of mechanisms and methods of analysis. *J Periodontol* 48:13-20, 1977.
3. Dills, S.S., Olshan, A.M., Goldner, S. et al. Comparison of the antimicrobial capability of an abrasive paste and chemical-soak denture cleaners. *J Prosthet Dent* 60:467-470, 1988.
4. Syed, S.A. and Loesche, W.J. Survival of human plaque in various transport media. *Appl Microbiol* 24:638-644, 1972.
5. Walker, C.B., Ratliff, D., Muller, D. et al. Medium for selective isolation of *Fusobacterium nucleatum* from human periodontal pockets. *J Clin Microbiol* 10: 844-849, 1979.
6. Mink, R.W., Biemer, T.A., Piannotti, R.S. et al. Volatile sulphur compound production in anaerobic oral bacteria. *J Dent Res* 62:180, 1983.



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A useful model for dental practice analysis, budgeting and income projection

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ABSTRACT

A versatile dental practice financial model, developed and utilized by the author, is presented. The model can be used by the dentist/manager to analyze dental practice financial data in order to identify practice inefficiencies and determine return on investment. It can also be used as a simple method of preparing a dental practice budget and projecting practice profit. Rationale for the model is explained and its use is discussed using hypothetical dental practice situations.

SOMMAIRE

Dans cet article, l'auteur présente un système financier flexible qu'il a élaboré et utilise lui-même pour son cabinet dentaire. Dentistes et gestionnaires peuvent l'utiliser pour analyser les données financières du cabinet afin d'en déterminer les insuffisances et les rendements sur le capital investi. Le système peut également servir à préparer le budget et à calculer les profits prévus. L'auteur en explique les avantages et montre comment l'utiliser en donnant des exemples pratiques. Cependant, pour bien l'utiliser, il se peut que les dentistes et les gestionnaires aient besoin d'aide professionnelle.

Key Words

Dental practice economics, dental practice management, dental practice finance, dental practice analysis.

Introduction

Logically, as the managers of small to mid-sized businesses, dentists should be able to use the financial data generated by their practices effectively. For example, this data should allow them to: determine the return on their capital investment, pinpoint financial trouble spots, assess the financial impact of contemplated practice changes, budget adequately, and properly assess

other financial considerations concerning their practices. Nevertheless, it has been the author's experience – based on personal consultations with more than 100 Canadian private practice dentists – that most dentists are unable to effectively utilize financial data from their practices. The reasons for this inability include insufficient data, interest, and/or understanding. However, the author believes that another key element is the lack of a useful model or framework to effectively study and manipulate practice financial data.

To determine if a model was available, the literature was reviewed. But while a number of articles were helpful, discussing such things as checking vital practice signs,¹ preventing cash-flow problems² and monitoring monthly trend indicators,³ a versatile financial model or framework for dental practice analysis, budgeting, and income projection was not found.

This article is intended to present a versatile financial model, developed and utilized by the author, which can be used to effectively analyze dental practice financial data, prepare a dental practice budget, and accurately project income and return on invested capital for various contemplated practice changes. In addition, the rationale for the structure of the model will be discussed, and applications for its use will be presented.

The Model

The basic model (for a typical solo dentist employing a hygienist) is presented in Table I. It is based on the principles of managerial accounting⁴ (as distinguished from financial accounting, which is used in preparing financial statements for external users such as the Revenue Canada). In addition, the concept of return on investment⁵ is addressed in the model, in order to assess the profitability of the practice.

Minor modifications and/or adjustments to the basic model are required when there are multiple producers or

professional corporations involved. However, these variations are simple, logical extensions of the basic model. For example, in group practices with multiple producers, in addition to analyzing the practice as a whole, each producer's efficiency should be assessed by individually allocating pro-rata expenses. When professional corporations are involved, income tax and owner-dentist salary will have been deducted on the corporation's income statement. Therefore, off-setting adjustments must be made when transferring corporate income data to the model.

The reader will immediately note that the model presented in Table I has the following characteristics:

i) Items listed in the financial model are stated in both dollars and percentage of total revenues.

ii) Revenues are broken down into dentist billings, auxiliary (hygienist) billings, and laboratory billings.

iii) Expenses are segregated into fixed and variable expenses. Fixed expenses are constant over a particular range of billings (e.g., rent), whereas variable expenses vary with the level of billings (e.g., supplies). Wage expense is listed separately since, although it is usually a fixed expense, it is also sometimes a partially variable expense item (e.g., commissions, bonuses, and profit-sharing).

iv) Operating income is determined before financing costs and depreciation have been deducted.

v) The fair market value of the dentist's labor and management effort (to be explained later) are subtracted from practice profit to determine return on the dentist-owner's net capital investment in the practice.

Rationale For The Model

There are many benefits to be gained from organizing the model in this way. Each of the characteristics of the model will be discussed in turn:

A) Stating listed items in both

dollars and percentage of total revenue.

Listing items in the model in both dollars and percentage of total revenue is very useful in delineating the specific financial features of a practice. The typical prepared year-end financial statement for a dental practice will itemize expenses in dollar terms only. This hinders the comparison of a dental practice with norms for the profession or with other practices, due to variations in practice size. Listing all items in percentage terms allows quick, meaningful analysis of a dental practice, since it will be readily apparent whether the subject practice is out-of-line with the norms for the profession. The items that are at variance with the norms for the profession can then be investigated to determine why this has occurred.

Before listing expense items in the model for analysis, adjustments must be made to correct for "tax planning" in the prepared year-end practice income statement, which distorts the economic reality of the practice (e.g., non-arms-length management company charges, abnormally high continuing education or depreciation expenses in a given year, etc.).

An estimate of general dental practice percentage norms for one particular Canadian city are listed in **Table II**. Dental practice expense norms for other cities or locations may vary from the percentages given in the table. Detailed practice expense norms for particular geographic areas are sometimes difficult to obtain, but regional data are published by some dental associations. In Canada, for example, the Manitoba,⁶ British Columbia, Nova Scotia, and Saskatchewan dental associations compile such data. If norms cannot be estimated with reasonable accuracy for a particular region, it will be more difficult to identify the specific expense items that are out-of-line. However, the overall efficiency of the practice will still be relatively easy to assess by comparing the return after owner remuneration and the percentage return on investment (to be discussed later in this article).

B) Revenues are broken down into dentist billings, auxiliary (hygienist) billings, and laboratory billings.

In prepared year-end dental practice financial statements, revenues are typically listed as one lump sum under total office gross billings. This lump sum figure reveals very little about the character of the practice. For instance, preven-

TABLE I:

Dental Practice Financial Model

	Dollars (\$)	Per cent (%)
REVENUE		
Dentist	\$ _____	_____ %
Auxiliary (Hygienist)	\$ _____	_____ %
Laboratory Fees	\$ _____	_____ %
TOTAL REVENUE	\$	100%
EXPENSE		
Variable Expense:		
Laboratory Fees	\$ _____	_____ %
Supplies-Dental	\$ _____	_____ %
Supplies-Office	\$ _____	_____ %
Bad Debts/Collection Fees	\$ _____	_____ %
Repair and Maintenance	\$ _____	_____ %
Variable Expense Subtotal	\$	_____ %
Wages and Benefits Expense:		
Fixed Wages and Benefits	\$ _____	_____ %
Variable Wages and Benefits	\$ _____	_____ %
Wages and Benefits Subtotal	\$	_____ %
Fixed Expense:		
Office Rent (all inclusive)	\$ _____	_____ %
Other Fixed Expense (*)	\$ _____	_____ %
Fixed Expense Subtotal	\$	_____ %
EXPENSE (excluding financing and depreciation)	\$	_____ %
OPERATING INCOME (before financing/depreciation)		
	\$	_____ %
Less, financing costs (interest/lease payments)	\$ _____	_____ %
Depreciation	\$ _____	_____ %
PROFIT	\$	_____ %
Less, dentist remuneration	\$ _____	_____ %
Management Remuneration	\$ _____	_____ %
RETURN AFTER OWNER REMUNERATION	\$	_____ %
*Other fixed expense includes: continuing education, insurance, telephone, professional fees, dues/licenses/subscriptions, automobile, business tax, advertising/promotion, miscellaneous.		

tive-oriented practices will have a high auxiliary (hygienist) billings percentage, and prosthetic-oriented practices will have a high laboratory billings percentage. The benefits that result from breaking down revenues into dentist, auxiliary (hygienist), and laboratory billings include:

i) The dentist-manager can more accurately estimate what "normal" staff wages should be for a particular practice and then compare that estimated norm with his or her actual wage expense percentage. For example, the author's experience suggests that the normal wage expense percentage for a Canadian solo general practice with a relatively typical revenue mix (70 per cent dentist, 20 per cent hygienist, and 10 per cent laboratory billings) runs about 25 per cent of gross revenues. However, given a comparable level of practice management efficiency, a 25 per cent wage expense would be considered too high for a practice with a low hygienist billings percentage and a high laboratory billings percentage; whereas, the 25 per cent figure would be considered relatively low for a practice with a high hygienist billings percentage and a low laboratory billings percentage. Therefore, before concluding that the wage expense percentage for a dental practice is too high or too low, it is essential to break down and assess the revenue mix. For Canadian dental practices, the author estimates the normal wage expense percentage could range from 18 per cent to 30 per cent, depending on the revenue mix of the practice.

ii) The dentist-manager would be able to accurately determine what a fair level of remuneration should be for the professional time, skill, care, and judgement provided by the dentist. Given the practice revenue mix, the appropriate professional remuneration can be easily estimated by calculating what an associate dentist would be paid in similar circumstances (usually a percentage, varying from 30 per cent to 50 per cent, of dentist billings). As will be emphasized later, calculating the appropriate professional remuneration is important in determining the return on investment and profitability for the practice.

iii) Also, the dentist-manager could identify potential problems in the practice by noting changes in the revenue mix, or wide variations in the revenue mix from general practice norms (e.g., a low or falling hygienist billings percentage might identify weakness in the preventive hygiene recall program, or a low

TABLE II:

Dental Practice Financial Model

	Local Norm (**)
REVENUE	
Dentist	70.0%
Auxiliary (Hygienist)	20.0%
Laboratory Fees	10.0%
TOTAL REVENUE	100.0%
EXPENSE	
Variable Expense:	
Laboratory Fees	10.0%
Supplies-Dental	7.5%
Supplies-Office	2.0%
Bad Debts/Collection Fees	1.0%
Repair and Maintenance	0.5%
Variable Expense Subtotal	21.0%
Wages and Benefits Expense:	
Fixed Wages and Benefits	25.0%
Variable Wages and Benefits	0.0%
Wages and Benefits Subtotal	25.0%
Fixed Expense:	
Office Rent (all inclusive)	5.5%
Other Fixed Expense (*)	6.0%
Fixed Expense Subtotal	11.5%
EXPENSE (excluding financing and depreciation)	57.5%
OPERATING INCOME (before financing/depreciation)	42.5%
Less, financing costs (interest/lease payments)	1.5%
Depreciation	2.5%
PROFIT	38.5%
Less, dentist remuneration	28.0%
Management remuneration	3.0%
RETURN AFTER OWNER REMUNERATION	7.5%
*Other fixed expense includes: continuing education, insurance, telephone, professional fees, dues/licenses/subscriptions, automobile, business tax, advertising/promotion, miscellaneous.	
**Winnipeg, Canada	

TABLE III:

$\text{Variable Expense Ratio} = \frac{\text{Variable Expense}}{\text{Revenue}}$	
Contribution Margin Ratio = 1 - Variable Expense Ratio	
$\text{Break Even Revenue} = \frac{\text{Fixed Expense}}{\text{Contribution Margin Ratio}}$	
Net Income Change = Revenue Change X Contribution Margin Ratio	

laboratory billings percentage could indicate a lack of comprehensive treatment planning.)

C) Expenses are segregated into fixed and variable expenses

Segregating practice expenses into fixed and variable categories provides valuable information to assist in effective managerial decision-making for the dental practice. For example, the break-even point can then be easily calculated in advance for contemplated practice changes, such as the purchase of major dental equipment or the hiring of an additional staff member. The break-even point is determined by dividing the fixed expense amount by the contribution margin ratio (1.0 minus the variable expense ratio) (Table III).

Segregating expenses into fixed and variable categories also allows one to accurately project net income (profit) for any level of revenue (gross billings) within a certain range. For instance, once the variable expense percentage (ratio) is determined, the change in practice net income for a given change in revenue can be easily calculated by multiplying the change in revenue by the contribution margin ratio (please refer to the last formula in Table III). The ability to accurately project net income will simplify the development of a practice budget projection.

D) Operating income is determined before financing costs and depreciation are deducted

Identifying operating income before financing and depreciation costs have been deducted allows the dentist-manager to compare the financial efficiency of his or her practice with norms for the profession on an "apples versus apples" basis. The level of financing costs for a practice has little to do with practice efficiency. Instead, it relates to the method used to finance the capital in-

vestment in the practice. Some dentists use banks and leasing companies to finance their capital investment and have substantial practice financing costs which reduce profits; others finance their capital investment with their own money and have no financing costs. Depreciation is a non-cash expense item that is usually based upon the book value of the tangible practice assets. This can also distort the apparent profitability (or efficiency) of a practice, unless the depreciation charged against the practice is a reasonable, realistic amount. Therefore, it is much more effective to compare a practice's operating income and the industry norms before the practice's financing and depreciation costs are deducted. The younger dentist with a heavily financed practice can then meaningfully compare the economic efficiency of his or her practice with an older dentist's practice that is fully paid for.

E) Return After Dentist Remuneration is calculated

Calculating the return after dentist remuneration for a dental practice is a very useful exercise, since it allows the dentist-manager to effectively assess the profitability, i.e. economic efficiency, of the practice.⁷ A good measure of business profitability is percentage return on investment (ROI). ROI can be calculated easily by dividing return after dentist remuneration, calculated in the

bottom line of the model illustrated in Table I, by the dentist's net capital investment in the dental practice (fair market value of all practice assets, including goodwill, less practice liabilities such as bank loans). (Please refer to Table IV for definition of terms.)

In order to determine the true profitability of an owner-operator business, the fair market value of the owner-operator's labor input into the business should be subtracted from total business profit. In a dental practice, the owner-dentist's labor consists of two components: professional services and management effort. The model illustrated in Table I allows this determination to be made. The fair market value of the dentist's professional services can be determined by calculating what an associate dentist would be paid in similar circumstances, usually a percentage of dentist charges (dentist remuneration in Table I). Estimating the fair market value of the owner-dentist's management effort in the practice (management remuneration in Table I) is a little more subjective, and each owner-dentist will have to assess the value of this management effort for his or her particular practice. Based on personal experience, the author has estimated that three per cent of total gross billings, for a typical solo practice with no in-house office manager, is a reasonable approximation of the fair market value of the management remuneration for the owner-dentist.

As can be seen in Table I, once dentist remuneration and management remuneration are estimated and entered into the model, the return after dentist remuneration can be determined. Then (as illustrated in Table IV) to estimate dental practice profitability, the return after dentist remuneration is simply divided by the owner-dentist's net capital investment in the practice. A reasonable approximation of net capital investment (practice value) will be adequate in order to assess practice profitability. Readers can refer to articles and books⁸⁻

TABLE IV:

$\text{Net Capital Investment} = \text{Practice Assets} - \text{Practice Liabilities}$	
$\text{Percentage Return On Investment} = \frac{\text{Return After Owner Remuneration}}{\text{Net Capital Investment}} \times 100$	

¹¹ on dental practice valuation methods, or professional dental practice valuers can be consulted.

Discussion

The financial model presented in this paper is relatively easy to use. It can be used manually, although the use of a computer spreadsheet program (e.g., Lotus or Excel) will save time, particularly in calculating "what if" projections and in budget preparation. Most experienced dentist-managers should be able to use this model in their practices without professional assistance. However, inexperienced dentist-managers and those with limited ability to interpret prepared financial statements may require professional assistance.

The effective use of the model to assess dental practice efficiency and profitability requires the previous year's prepared financial statements, plus a modest amount of additional information. The additional data required are: a break down of the practice revenue mix, expense adjustments to reflect economic reality, local practice expense norms, a knowledge of associate dentist remuneration norms in the community, an estimate of the dentist's management effort in the practice, and an estimate of the dentist's net capital investment in the practice. Once this information is available, it is then simply a matter of plugging the data into the model and calculating percentages. Key areas to assess include:

- i) practice revenue mix, as previously discussed
- ii) all expense categories for variance from community norms
- iii) operating income before financing and depreciation expenses have been deducted
- iv) ROI.

Other than for a new dental practice which is still in the introductory or rapid growth phase of its development, the author considers a dental practice ROI less than the market rate for low-risk investments as unacceptable. Logically, ROI should be greater for higher risk dental practices (e.g., practices located in one-industry towns and those where a high percentage of the practice value is allocated to goodwill). Readers interested in a more detailed discussion of dental practice profitability analysis should refer to articles by the author and others.^{1,3,7}

Table V illustrates, using simple examples, the value of the model for identifying variations from local percentage

TABLE V:

Dental Practice Financial Model

	Local Norm	Dr. A. Good	Dr. B. Good	Dr. Poor
REVENUE				
Dentist	70.0%	70.0%	70.0%	70.0%
Auxiliary (Hygienist)	20.0%	20.0%	20.0%	20.0%
Laboratory Fees	10.0%	10.0%	10.0%	10.0%
TOTAL REVENUE	100.0%	100.0%	100.0%	100.0%
EXPENSE				
Variable Expense:				
Laboratory Fees	10.0%	10.0%	10.0%	10.0%
Supplies-Dental	7.5%	7.0%	7.0%	9.5%
Supplies-Office	2.0%	2.0%	2.0%	2.0%
Bad Debts/Collection Fees	1.0%	0.5%	0.5%	3.0%
Repair and Maintenance	0.5%	0.5%	0.5%	0.5%
Variable Expense Subtotal	21.0%	20.0%	20.0%	25.0%
Wages and Benefits Expense:				
Fixed Wages and Benefits	25.0%	21.0%	21.0%	30.0%
Variable Wages and Benefits	0.0%	0.0%	0.0%	0.0%
Wages Benefits Subtotal	25.0%	21.0%	21.0%	30.0%
Fixed Expense:				
Office Rent (all inclusive)	5.5%	4.0%	4.0%	9.0%
Other Fixed Expense (*)	6.0%	5.0%	5.0%	6.0%
Fixed Expense Subtotal	11.5%	9.0%	9.0%	15.0%
EXPENSE (excluding financing and depreciation)				
	57.5%	50.0%	50.0%	70.0%
OPERATING INCOME (before financing/depreciation)				
	42.5%	50.0%	50.0%	30.0%
Less, financing costs (interest/lease payments)	1.5%	0.0%	10.0%	0.0%
Depreciation	2.5%	2.5%	2.5%	2.5%
PROFIT	38.5%	47.5%	37.5%	27.5%
Less, dentist remuneration	28.0%	28.0%	28.0%	28.0%
Management remuneration	3.0%	3.0%	3.0%	3.0%
RETURN AFTER OWNER REMUNERATION				
	7.5%	16.5%	6.5%	-3.5%
*Other fixed expense includes: continuing education, insurance, telephone, professional fees, dues/licenses/subscriptions, automobile, business tax, advertising/promotion, miscellaneous.				

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TABLE VI:

Example:

Dr. A. Good (see Table V) is contemplating the addition of a full-time staff member with a fixed annual salary of \$20,000.

Using Table III:

Variable Expense Ratio =	0.20	
Contribution Margin Ratio =	1.0 - 0.20	= 0.80
Break Even Revenue =	\$20,000/yr.	= \$25,000/yr.
	0.80	
Net Income (Profit) Increase	= R revenue	X 0.80
Beyond Break-Even Revenue	Increase	

norms and for comparing practices on an "apples versus apples" basis. As can be seen in the table, Dr. Poor's practice is very much out-of-line with the average practice norms in the community. Dr. Poor should investigate dental supplies, bad debts, wages, and office rent expense to determine the reasons for these variations. They are having a devastating effect on his operating income, to the point where there is a negative return on net invested capital.

The value of the model as a means of effectively comparing practices with differing debt levels is also illustrated in Table V, through the practices of Dr. A. Good and Dr. B. Good. Although the two practices show very different profit levels, they appear to be equally efficient since operating income and all operating expenses are the same for both of them. The reason for the substantial variation in profit is entirely due to the different methods used to finance the capital investment in the practices. Dr. A. Good has a fully paid for practice with no financing cost; whereas Dr. B. Good's practice obviously has considerable outstanding debt, resulting in very large financing costs.

The model can also be used effectively to prepare a dental practice budget for the next year. A computer spreadsheet application is very useful for this purpose. Fixed expense items in the budget can be estimated easily from the previous year's income statement. Once the variable expense percentages are calculated for the previous year, they can be used to project variable expense for the next year's budgeted production.

Further, the model (together with the simple formulae in tables III and IV) can be a useful tool when the dentist-manager is contemplating practice

changes. For example, the impact on practice profitability from the fixed financing and depreciation expense incurred by major capital purchases (such as a pantographic X-ray or a laser) can be easily assessed once the variable expense percentage has been determined from the model. Similarly, the economic impact of a staff addition or deletion can be easily assessed. Table VI presents a simple example of how to assess the economic implications of adding an additional full-time salaried employee to a practice.

Summary

A model for dental practice analysis, budgeting, and income projection has been presented. The rationale for the model was explained and its versatility discussed. Various examples were used

to illustrate the usefulness of the model as a management tool for the dentist-owner.

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References

1. Reed, O. Checking the vital signs of your dental practice. *Dent Econ* 80:55-57, 1990.
2. Caplan, C. How to prevent cash-flow problems. *Dent Management* 22:24-27, 1982.
3. Anderson, P. Monthly trend indicators monitor practice health. *Dent Econ* 77:73-78, 1987.
4. Engler, C. *Managerial Accounting*. Homewood, IL, Irwin, 1987.
5. *Ibid*, 882.
6. House, R. et al. *1989 Report on the Dental Profession*. Winnipeg, Manitoba Dental Association, 1989.
7. Stockton, J. Is your dental practice a profitable business? *J Can Dent Assoc* 56:1,093-1,095, 1990.
8. Pratt, S. *Valuing small businesses and professional practices*. Homewood, IL, Dow-Jones-Irwin, 1986, pp. 277-338.
9. Jackson, J., Hill, R., Crandall, A. et al. Determining the value of your practice, a realistic approach. *JADA* 109:402-412, 1984.
10. Stockton, J. The income approach to dental practice valuation. *J Dent Pract Admin* 5:30-33, 1988.
11. Jackson, J. and Hill, R. *Dental practice valuation and associateship arrangements*. Chicago, Quintessence, 1987.

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 (204) 453-0055

March 21-25, 1992
Association of Prosthodontists of Canada
and the Canadian Association of
Oral & Maxillofacial Surgeons
Banff, Alberta
 Dr. Lawrence St. Pierre (705) 737-0607
 Dr. Brian Kucey (403) 468-7270

May 3-7, 1992
Les journées dentaires
 (514) 875-8511

May 14-16, 1992
ODA Spring Meeting
 (416) 922-3900

May 30, 1992
New Brunswick Dental Society
 (506) 452-8575

June 18-20, 1992
Newfoundland Dental Association
 (709) 579-2362

August 29-September 2
1992 Canadian Dental Association
Annual Convention
Calgary, Alberta
 Janice Edgar (613) 523-1770
 (outside Canada)
 1-800-267-6364 (East) or
 1-800-267-6354 (West)

January/Janvier 1992

January 11-12: ACOI Winter Seminar: Live Implant Surgery Utilizing Blades in Phoenix, AZ. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

January 25-February 1: 28th International Alpine Dental Conference in Courchevel 1850, France. Contact: The International Dental Foundation, 53 Sloane St, London, SW1X 9SW, England.

January 29-February 1: Miami Winter Meeting 1992 A Journey to Synergy at the Hyatt Regency Miami. For further information, call (305) 667-3647 or (305) 944-5668.

February/Février 1992

February 8-15: Barbados Dental Association Convention. For convention pre-registration (limited), travel and accommodation at group fares, please contact: Lynne Brandon CDA, 85 Lonsdale Dr, London, Ont N6G 1T4. Tel: (519) 657-4306 (evenings).

February 10-15: Mid Winter Dental Convention and Maxillofacial Surgical Symposium, Grand Barbados Beach Resort. For more details, contact: Dr. Derek H. Golding, Convention Chairman, Barbados Dental Association, P.O. Box 95, Bridgetown, Barbados. Tel: (809) 426-9140.

February 12-16: Annual Convention of the Jamaica Dental Association in Ocho Rios, Jamaica. For further information on registration, contact: Dr. Keith Williams, Chairman, Convention Committee, 8 Melmac Ave, Kingston 5, Jamaica, WI. Tel: (809) 92-68209.

February 14: The Academy of Dental Materials and the University of Louisville Conference: Materials Research in Maxillofacial Prosthetics in Chicago, Illinois. For details, contact: Dr. Lawrence Gittleman or Dr. Zafrulla Khan at the University of Louisville School of Dentistry. Tel: (502) 588-5045.

February 15-16: Midwest Society of Periodontology 35th Annual Meeting in Chicago, Illinois. Contact: Midwest Society of Periodontology, 1775 Glenview Rd., Suite 212, Glenview, Illinois 60025. Tel: (708) 724-6396.

February 15-22: Dalhousie Ski Seminar in Jasper, Alberta: "Achieving Excellence in Restorative Dentistry" and "Clinical Oral Pathology for General Dentists." Contact: Alumni Affairs and Continuing Education. Tel: (902) 494-1674.

February 16-19: 127th Annual Midwinter Meeting of the Chicago Dental Society. Contact: Chicago Dental Society, 401 N. Michigan Ave, Suite 300, Chicago, IL 60611-4205, USA. Tel: (312) 836-7300. Fax: (312) 836-7337.

February 22-29: Virgin Islands Dental Association Convention. For convention pre-registration (limited), travel and accommodation at group fares, please contact: Lynne Brandon CDA, 85 Lonsdale Dr., London, Ont N6G 1T4. Tel: (519) 657-4306 (evenings).

March/Mars 1992

March 8-12: The 15th Asian Pacific Dental Congress in Auckland, New Zealand. For registration forms, contact: New Zealand Dental Association, PO Box 28 084, Remuera, Auckland, New Zealand.

March 26-28: World Congress XII for Oral Implantology in Sydney, Australia. For details, contact: Margaret M. Jackson, Executive Director, The International Congress of Oral Implantologists, 248 Lorraine Ave, Upper Montclair, NJ 07043, USA. Tel: (201) 783-6300. Fax: (201) 783-1175.

March 27: George C. Hare Lectureship: Dr. James L. Gutmann on "Parameters of Clinical Success in Endodontic Treatment and Retreatment" at the University of Toronto. For more details, contact: University of Toronto, Faculty of Dentistry, 124 Edward St., Toronto, Ontario, M5G 1G6. Tel: (416) 979-4404.

March 28-April 4: 29th International Alpine Dental Conference in Courchevel 1850, France. Contact: The International Dental Foundation, 53 Sloane St, London, SW1X 9SW, England.

April/Avril 1992

April 3-4: Southern Ontario Surgical Orthodontic Study Group Spring Meeting in Windsor, Ontario. For more information, contact: Dr. Jeff Berger. Tel: (519) 258-2632.

April 6-11: 25th International Dental Show in Cologne, Germany. For information, contact: Verband der Deut-

schen Dental Industrie e.V., Pipinstrasse 16, W-5000 Köln 1, Germany.

April 8-12: XI International Conference on Oral and Maxillofacial Surgery in Buenos Aires, Argentina. For information and registration, contact the Secretariat at the following address: XI ICOMS, Casilla de Correo 4437, 1000 Correo Central, Buenos Aires, Argentina.

April 29-May 3: 8th Annual Scientific Sessions of the American Academy of Cosmetic Dentistry in Palm Springs, Calif. For more information, contact: Barbara Jo Zoelle, The American Academy of Cosmetic Dentistry, 2711 Marshall Ct, Madison WI 53705. Tel: (608) 238-6529.

May/Mai 1992

May 7-8: Association Internationale Francophone de Recherche Odontologique 9th Colloquium will be held at the University of Montreal in Montreal, Quebec. For details, contact: Dr. Daniel Grenier, secretary of AIFRO, Faculté de Médecine Dentaire, Université de Montréal, Montréal, Québec. Tel: (514) 343-2385.

May 10-13: Annual Conference of the Canadian Long Term Care Association in Winnipeg, Manitoba. Inquiries, contact: Mary Peterson Elias, Continuing Education Division, University of Manitoba, Winnipeg, Manitoba, R3T 2N2. Tel: (204) 474-9923.

May 14: University of Toronto Class of '67 Reunion celebrating 25th year in the main ballroom of the Admiral Hotel in Toronto. For more details, contact: M. Naiberg, 8199 Yonge St., Suite 404, Thornhill, Ontario. Tel: (416) 889-0810.

May 23-30: Travel and Learn Cruise to Alaska departing from Vancouver, British Columbia on the Regal Princess. Contact: University of British Columbia, Continuing Dental Education, 105-2194 Health Sciences Mall, Vancouver, BC, V6T 1Z3. Tel: (604) 822-2627.

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Dr. A.R. Macdonald & Dr. Rob Bond of Canadian Straight Wire & Functional Orthodontic Program will be offering a Hygienist & Assistant Course in Orthodontics & Cephalometric Tracing. Feb. 28, 29, & Mar. 1, 1992 at Stage West Hotel, Mississauga. Cost \$345. To register write: CSW & FOP, Box 986, Simcoe, Ont. N3Y 1B8 or call (519) 426-9140. (12/01)

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Scientific Articles:

Are contributions dealing with research, diagnosis and treatment of dental disease, studies in education, clinical and laboratory research and other detailed investigations pertinent to dentistry and related fields. The text should not exceed 2,500 to 3,000 words.

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1. Hechter, F.J., Symmetry and dental arch form of orthodontically treated patients. *JCDA* 44:173-184, 1978.

For books, give the author's name, book title, location and name of publisher, and year of publication, i.e.,

2. Kilpatrick, H.C. *Work simplification in dentistry*, ed. 2, Philadelphia, Saunders, 1964.

Illustrations:

Should be of high (professional) quality for reproduction.

All photographs should be submitted in triplicate as glossy black and white or color prints, or as color slides. When color slides are submitted, authors may submit one color slide and two glossy color prints of each illustration rather than three color slides.

On the back of each print or slide, the figure number and the top edge should be indicated lightly using a grease pencil.

Each set of photographs and slides should be placed in a separate envelope and marked with the authors' name and the title of the article. Photographs and slides will be kept on file in the *Journal* department for a year following publication. Authors may request return of their illustrations only up until that time. (The editor reserves the right to print color prints or slides in either black and white and/or color, as he sees fit.)

Graphs and line drawings should be of professional quality. The original drawing should be submitted, if possible, or a black and white glossy print of the drawing.

Tables, Charts and Graphs:

Should be well organized to complement the text. They should be keyed by number in order of appearance in the manuscript. Each of these illustrations should be on a separate page with title and footnotes.

Legends:

For all illustrations must be typed (grouped) on a separate page. Photomicrograph legends must specify original magnification and stain.

Most articles are published at no cost to the author, but a fee could be levied if extensive illustrative, formular, tabular or photographic matter is used.

Permissions and Waivers:

Must accompany the manuscript. Waivers are mandatory for the publication of photographs of patients unless faces are masked to prevent identification. Waiver forms are available from the *Journal* of the Canadian Dental Association. Permission of the author and publisher must be obtained for use of previously published material quoted in the text and for use of previously published illustrations.

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Twenty-five complimentary reprints are mailed to the corresponding author of Scientific articles after the article is published. Additional reprints of Scientific articles, or reprints of Feature articles are available through the *Journal* for a fee. Additional copies (tear sheets) of articles may be requested 30 days prior to publication. Prices for reprints and copies (tear sheets) are available upon request.

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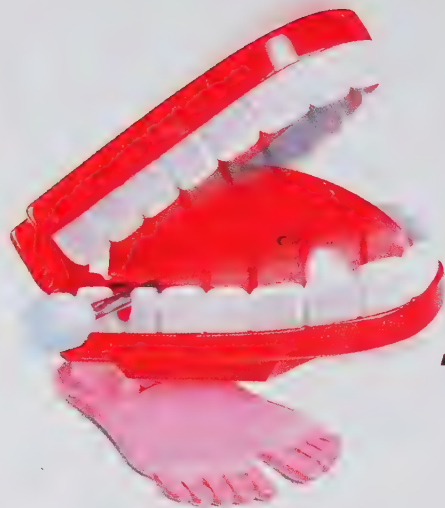
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¹Clinical studies available upon request. ²"A Clinical Evaluation of Polishing Amalgams Immediately After Insertion: 36-Month Results," Corpron, R.; Straffon, L.H.; Dennison, J.B.; Asgar, K. *Pediatric Dentistry* 1983, Volume 5, Number 2, pp. 126-130.



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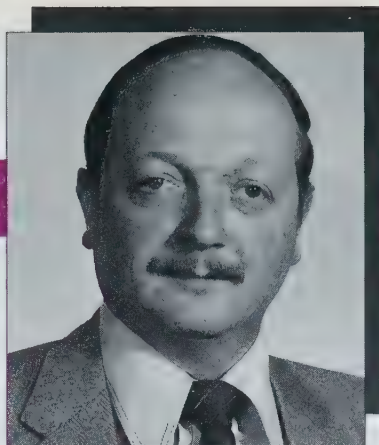
"In medicine, every meaningful endeavour leads ultimately to the patient. Yet, despite the enthusiasm and productivity of investigators, and despite the improvement in techniques of health care delivery, the key factor in bringing the best of modern medicine to each patient is the knowledge and motivation of the practitioner. This is the narrowing of the funnel. If the system falters at this level, all that went before is meaningless."

*Robert H. Moser,
JAMA*

«En médecine, tous les efforts significatifs mènent en définitive au patient. Toutefois, malgré l'enthousiasme et le rendement des chercheurs, malgré l'amélioration des techniques de distribution des soins de santé, les connaissances et la motivation du praticien demeurent la clef de voûte qui permet d'apporter à chaque patient les avantages de la médecine moderne. Ce facteur marque le point de rétrécissement de l'entonnoir. Quand le système échoue à ce niveau, tout ce qui l'a précédé ne signifie plus rien.»

*Robert H. Moser,
JAMA*

CHAIRMAN'S MESSAGE



MOT DU PRÉSIDENT

It is a pleasure to present this, my first report as chairman of CFDE's Board of Trustees. On behalf of my fellow Trustees and indeed of the dental profession in Canada, I would like to thank my predecessor, Dr. Ted Ramage, who so capably guided the affairs of the Fund during his three-year term as CFDE chairman.

This year CFDE is celebrating its 30th Anniversary. Since its inception, the Fund has played a vital role in insuring dentistry's place in the Canadian health care system. To date, more than \$3,400,000 have been raised in support of dental education, service and research.

The past year has been a difficult one for many groups, but particularly for fund raising organizations. However, as can be seen in this report, the loyalty and generosity of CFDE supporters has allowed us to maintain and improve the Fund's potential to assist Canadian dental programs.

We wish to extend our sincere thanks to the many individuals, corporations and associations whose contributions make it possible for CFDE to continue its work on behalf of Canadian dentistry. Special thanks are also extended to editors of the many dental publications who so generously promote CFDE; particularly the CDA Journal, CDHA Probe, the CDAA Journal, ACFD Forum, Oral Health and each of the ten provincial publications.

Your CFDE Trustees strive to serve the best interests of the dental profession and look forward to your continued support in the years ahead. Your comments and suggestions are always welcome, and if you would like more information about any of the Fund's activities, do not hesitate to let us know.

Please join us in celebrating the 30th Anniversary of the Canadian Fund for Dental Education in 1992.

A handwritten signature in dark ink, appearing to read 'G. Thompson'.

Gordon W. Thompson, D.D.S., Ph.D., F.R.C.D. (C)

Il me fait plaisir de vous présenter ce premier rapport en tant que président du Conseil des fiduciaires du FCED. Au nom de mes collègues et de la profession dentaire du pays, je remercie mon prédécesseur, le docteur Ted Ramage, d'avoir si bien dirigé les affaires du fonds au cours des trois années qu'il a passées à sa présidence.

Le FCED fête cette année son 30^e anniversaire. Depuis sa création, il a joué un rôle essentiel en veillant à ce que la dentisterie occupe la place qui lui revient dans les services de santé du pays. Il a recueilli jusqu'ici plus de 3 400 000 \$ pour aider au financement de l'enseignement, des services et de la recherche dentaires.

Si elle a été difficile pour beaucoup d'organisations, l'année 1991 l'aura été de façon particulière pour les organisations de financement. Néanmoins, comme le fait voir le rapport, la loyauté et la générosité des donateurs nous a permis de maintenir et même d'augmenter la capacité du fonds d'aide aux programmes dentaires du pays.

Nous désirons remercier les nombreuses personnes, sociétés et organisations qui ont, par leurs contributions, permis au FCED de poursuivre ses efforts au nom de la dentisterie canadienne. Nous remercions particulièrement les éditeurs des diverses publications dentaires qui ont généreusement aidé à promouvoir le FCED, notamment le Journal de l'ADC, CDHA Probe, CDA Journal, Forum, de l'ACFD, Oral Health et chacune des dix publications provinciales.

Les fiduciaires du FCED s'efforcent de servir au mieux les intérêts de la profession dentaire et comptent sur votre appui pour les prochaines années. Vos observations et suggestions sont toujours bienvenues et nous demeurons à votre disposition pour vous renseigner davantage sur les diverses activités du Fonds.

En 1992, célébrez avec nous le 30^e anniversaire de la fondation du Fonds canadien pour l'enseignement dentaire.

Five Ways To Support CFDE

CFDE is a national, non-profit organization designed to secure funds for the promotion of good dental health through education, research and service.

To share CFDE's concern for the profession and the public, consider the following ways you can help:

- ◆ With an **annual unrestricted contribution**.
- ◆ With a **living memorial** honouring the memory of a friend, colleague or loved one.
- ◆ With a **tribute gift** to mark all the important events in the lives of those close to you.
- ◆ With a **bequest** in your will.
- ◆ With a **personal endowment**, now or in your will, for the benefit of dental health in perpetuity.

CFDE - your opportunity to serve the future of dentistry!

Cinq façons de contribuer au FCED

Le FCED est un organisme sans but lucratif, d'échelle nationale, qui recueille des fonds destinés à la promotion de la santé dentaire au moyen d'enseignement, de recherche et de services.

Vous pouvez partager l'intérêt que porte le FCED à la profession et au public des cinq façons suivantes:

Grâce à une **contribution annuelle sans restrictions**,

- ◆ à un **don commémoratif** en mémoire d'un ami, d'un collègue ou d'une personne bien-aimée,
- ◆ à une **carte de témoignage** destinée à marquer une occasion spéciale dans la vie de ceux qui vous sont proches.
- ◆ à un **legs** dans votre testament,
- ◆ à un **fonds personnel de dotation**, maintenant ou sous forme de legs dans votre testament, au profit de la santé dentaire à perpétuité

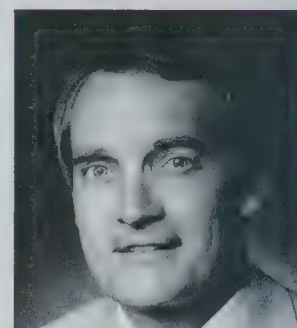
Le FCED - il n'y a pas de meilleure façon de seconder la profession!



*Dr. Gordon W. Thompson,
Chairman/Président
Edmonton, Alberta*



*Mr. Lee Maddison
Vice-chairman/Vice-président
Dental Industry
Industrie dentaire
Toronto, Ontario*



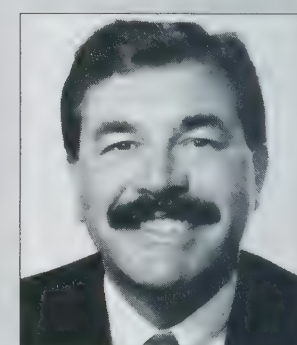
*Dr. Donald J. O'Connor
Ottawa, Ontario*



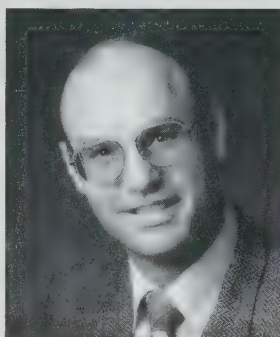
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*Dr. Gregory Baird,
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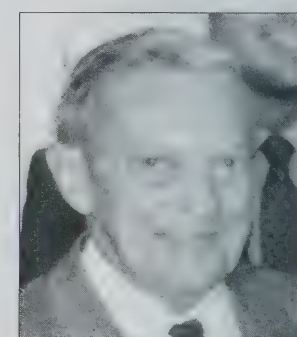
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*Dr. David L. Singer
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*Dr. Robert Dupont,
Montréal, Québec*



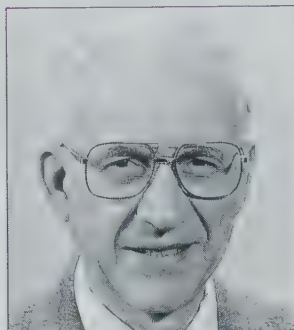
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Dental Industry/
Industrie dentaire*



*Dr. François M. Bourassa
Regina, Saskatchewan*



Dr. Kenneth Bentley,
Chairman/Président
Montréal, Québec



Dr. Ernest Ambrose,
Saskatoon, Saskatchewan



Dr. Marcia A. Boyd,
Vancouver, British Columbia/
Colombie-Britannique

CFDE Office/ Bureau du FCED

1815 promenade Alta Vista Drive
Ottawa, Ontario K1G 3Y6
Tel: (613) 731-0493



Julie Hentschel
Fund Administrator/
Administrateur du Fonds

ENDOWMENT AND DEVELOPING FUNDS

Throughout the years, several endowment and developing Funds have been established to honour special individuals and to benefit dental education, research and service.

Dr. Lorne E. MacLachlan Endowment Fund: Provides financial assistance for teacher education and training in Removable Prosthodontics and Maxillofacial Prosthodontic Divisions of four Canadian dental faculties.

Mr. Murray M. McDonald Endowment Fund: Established in honour of the CFDE's former Executive Director, sponsors a lecture held annually at the CDA Convention.

Dr. Nicholas A. Mancini Fund and Dr. G.W. Barrett Memorial Fund: established to provide grants to undergraduate dental and dental hygiene students in need of urgent financial assistance.

Dr. Thomas M. Curry Memorial Endowment Fund: a special new fund established in memory of a prominent Alberta public health dentist, will assist in supporting a dentist in a postgraduate or graduate program in Dental Public Health.

Mr. Donald L. Winget Memorial Developing Fund: a tribute to a gentleman with a keen personal interest in practice management, this special new fund will continue his support of dental education.

Lieutenant-Colonel Charles Hunt Endowment Fund: established in recognition of his contribution to dentistry and the Canadian Dental Corps, this fund will help promote dental education and research across Canada.

Dr. Kenneth L. Lawless Developing Fund: A major donation of \$7,500 by Dr. Lawless, in appreciation of professional support to referring dentists in the Kingston - Belleville - Brockville area, upon reaching \$10,000 will become an endowment fund, with interest earned being directed to support worthwhile programmes in dentistry.

FONDS DE DOTATION ET EN DÉVELOPPEMENT

Plusieurs fonds de dotation ou en développement ont été créés au cours de l'année pour rendre hommage à certaines personnes tout en aidant à l'enseignement, à la recherche et aux services dentaires.

Fonds de dotation D^r Lorne E. MacLachlan – Ce fonds permet d'aider financièrement à la formation de professeurs en prothèses amovibles et maxillo-faciales de quatre facultés dentaires du pays.

Fonds de dotation M. Murray M. McDonald – Créé en l'honneur de l'ancien directeur du FCED, ce fonds permet de parrainer annuellement une conférence au congrès de l'ADC.

Fonds du D^r Nicholas A. Mancini et à la mémoire du D^r W. Barrett – Ces fonds ont été créés pour aider des étudiants du premier cycle en médecine dentaire ou en hygiène dentaire qui ont un besoin urgent d'aide financière.

Fonds de dotation D^r Thomas M. Curry – Ce nouveau fonds a été créé spécialement pour honorer la mémoire d'un éminent dentiste des services d'hygiène publique de l'Alberta et aidera un dentiste à poursuivre des études supérieures ou avancées en hygiène dentaire publique.

Fonds en développement M. Donald L. Winget – Créé en hommage à une personne qui s'est vivement intéressée à l'administration du cabinet dentaire, ce nouveau fonds continuera d'aider à l'enseignement dentaire.

Fonds de dotation Lieutenant-colonel Charles Hunt – Créé en reconnaissance de la contribution de cet officier à la dentisterie et au Corps dentaire des Forces canadiennes, ce fonds aidera à promouvoir l'éducation dentaire et la recherche au pays.

Fonds en développement D^r Kenneth L. Lawless – L'important don de 7 500 \$ que le Dr Lawless a versé pour rendre hommage à l'appui professionnel que rendent les dentistes qui lui envoient des patients dans la région de Kingston, Belleville et Brockville, deviendra un fonds de dotation dès qu'il aura atteint 10 000 \$. Les intérêts serviront à soutenir certains programmes importants en dentisterie.

HIGHLIGHTS OF 1991 INCOME/APERÇU DES RECETTES DE 1991

Total income from all sources in 1991 was \$396,465, slightly less than the total income in 1990, which included a one time \$25,000 donation to the Lorne MacLachlan Endowment Fund. However, \$370,445 in donations were directed to the unrestricted general fund, compared to last year's \$358,671. Donations to the endowment and developing funds totalled \$26,020. The use of these resources are restricted according to the specific guidelines of each of the funds.

The Board of Trustees is pleased to report that the Thomas Curry Memorial Fund and the Lieutenant-Colonel Charles Hunt Fund have reached \$10,000 respectively, which elevates each to the status of CFDE Endowment Fund. Donations received in memory of the late Mr. Donald Winget are recorded in the financial statements under the special designation "Developing Funds". A generous and imaginative donation of \$7,500 from Dr. Kenneth W. Lawless, of Kingston, Ontario, which was made on behalf of referring dentists in his area, is also listed as a "Developing Fund".

Personal contributions from dentists reached an unprecedented high of \$109,890 in 1991, an increase of 8% from 1990. Support from our friends in business and industry was \$117,831, up 5% from the 1990 total of \$112,257.

Allied dental health professionals and organizations across Canada increased their 1991 contribution to the Fund to \$5,123 from the 1990 total of \$4,320. The Board believes, however, that more hygienists should be contributing to CFDE. The Fund is working closely with the leaders of the Canadian Dental Hygienists' Association and the Canadian Dental Assistants' Association to increase awareness of CFDE among members of the two groups.

A first-time donation from Lederle Laboratories, representing a pledged donation for anonymous surveys completed and returned by a random selection of dentists; and a local component dental society's contribution of a specified amount made on behalf of each of its members, are just two of many innovative ideas implemented by the dental industry and dental organizations that believe in and support CFDE.

The 12% increase in the income earned by CFDE investments was due to favourable interest rates on several long-term capital investments acquired in 1989 and 1990.

Globalement, les recettes de 1991 se sont élevées à 396 465 \$, un peu moins qu'en 1990; elle comprennent une dotation de 25 000 \$ au fonds Lorne MacLachlan. Néanmoins, une somme de 370 445 \$ a été versée au fonds général, comparativement à 358 671 \$ l'année précédente. Les dons versés aux fonds de dotation et en développement, qui doivent être utilisés aux fins auxquelles ils sont destinés, s'élevèrent à 26 020 \$.

Le Conseil des fiduciaires a le plaisir de vous informer que le Fonds à la mémoire de Thomas Curry et le Fonds du lieutenant-colonel Charles Hunt ont atteint 10 000 \$ chacun, ce qui les classe maintenant dans la catégorie des fonds de dotation du FCED. Les dons reçus à la mémoire de M. Donald Winget sont consignés dans les états financiers au chapitre des «Fonds en développement». Celui-ci comprend également le don original et généreux de 7 500 \$ que le Dr Kenneth W. Lawless, de Kingston (Ontario), a versé au nom des dentistes qui lui envoient des patients.

Les contributions personnelles des dentistes ont atteint un sommet sans précédent de 109 890 \$, soit 8 % de plus qu'en 1990. Celles des amis et de l'industrie s'élèvent à 117 831 \$, soit 5 % de plus que la somme de 112 257 \$ recueillie en 1990.

Les professions connexes et les organisations du pays ont haussé leurs contributions en 1991, les portant à 5 123 \$ comparativement à 4 320 \$ en 1990. Le Conseil estime cependant que les hygiénistes devraient contribuer au FCED en plus grand nombre. Le Fonds aide l'Association canadienne des hygiénistes dentaires et l'Association des assistantes dentaires à sensibiliser davantage leurs membres.

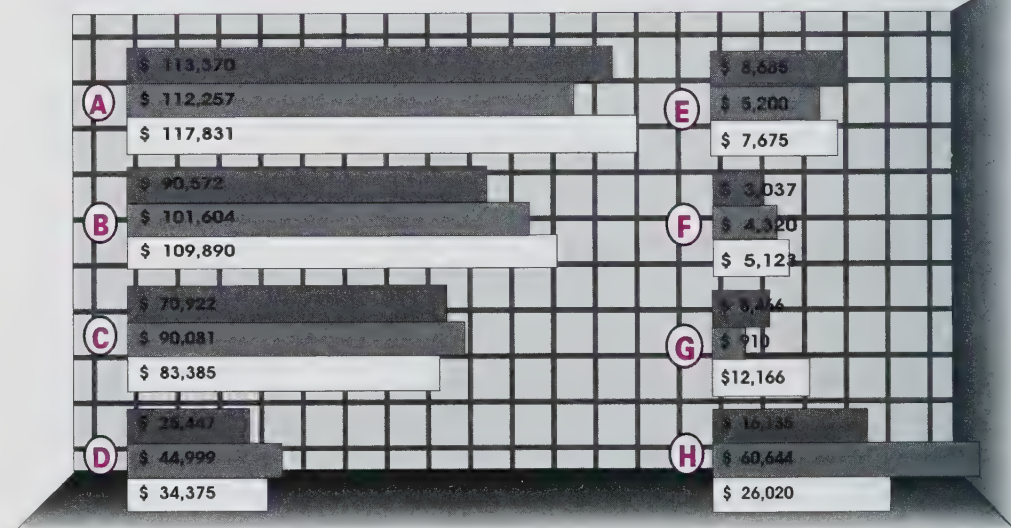
Parmi les initiatives nouvelles de l'industrie et des organisations dentaires pour appuyer le FCED, soulignons le premier don des Laboratoires Lederle, qui a pris la forme d'un engagement à mener auprès des dentistes des sondages dont le premier a été fait au cours de l'année ainsi que la contribution qu'une société dentaire locale a versée au nom de chacun de ses membres.

Les revenus de placement du FCED ont monté de 12 %, grâce aux bons taux d'intérêt obtenus sur plusieurs placements à long terme effectués en 1989 et 1990.

- A** Business & Industry/
Entreprises et Industries
- B** Dental Profession/
La profession dentaire
- C** Investment & Sundry Income/
Revenus de placements et
de sources diverses
- D** Dental Organizations/
Organismes dentaires
- E** Memoriam Donations/
Dons commémoratifs
- F** Allied Dental Health Professionals
and Organizations/
Professionnels et organismes
de la santé dentaire
- G** Tributes & Other Contributions/
Hommages et autres contributions
- H** Gifts to Endowment &
Developing Funds/
Dons aux fonds de dotation &
de fonds en développement

INCOME/REVENUS - 1989 - 1991

■ 1989
■ 1990
□ 1991



GRANTS AWARDED / SUBVENTIONS ACCORDÉES EN 1991

Brief descriptions of major projects supported by the CFDE:

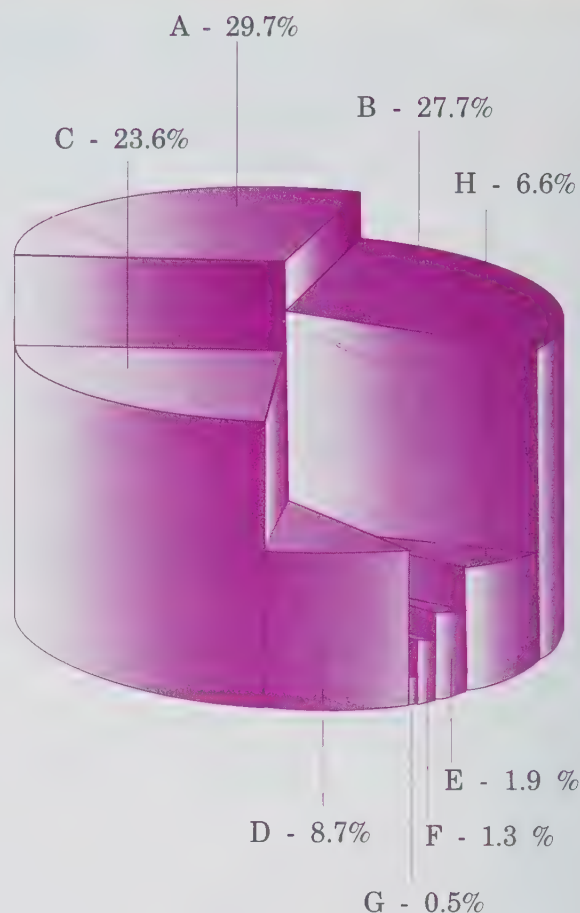
- ◆ **Grants to Dental Faculties** **\$35,000**
Unrestricted grants of \$1,500 and two undergraduate grants of \$1,000 are awarded annually to each of the ten dental faculties.
- ◆ **ACFD Teaching and Management Institutes** **\$43,000**
Since 1986, the ST/MI has provided Canadian dental educators practical teaching methods, and has assisted both new and experienced administrators in assessing and improving their current management skills.
- ◆ **Teaching Conference** **\$10,000**
The 35th Annual dental teaching conference entitled "Problem-based Learning: Another Approach to Education" brought together forty participants from across Canada, representing dentistry and allied dental health professionals.
- ◆ **CDA Patient Information System Program** **\$30,000**
A series of eight information booklets on various aspects of dental health for dental patients. This project is generously sponsored by Colgate-Palmolive.
- ◆ **Student Clinician Program** **\$10,225**
Through the sponsorship of **Dentsply Canada Limited**, student representatives from each Canadian dental faculty participate in this program at the CDA Convention.
- ◆ **Nicholas A. Mancini & G. W. Barrett Grants** **\$3,500**
Five individuals were assisted in 1991 with grants for undergraduate students in extreme financial difficulty.
- ◆ **Wrigley Dental Research Awards Program** **\$10,000**
Wrigley Canada Inc. provides funds annually to sponsor awards to dental students involved in research projects in any area of Oral Biology, with preference for the benefits of salivary stimulation and caries reduction.
- ◆ **CFDE Teacher Training Fellowships** **\$25,500**
Fifteen applicants received fellowship awards in 1991, including a **Warner-Lambert Canada Inc.** sponsored award for an existing dental or dental hygiene teacher (\$2,500), and the **Henry Thornton Award** (\$1,000) from **Dentsply Canada Ltd.**, for the most meritorious applicant.
- ◆ **CDA/CFDE Dental Students' Conference** **\$11,000**
An annual orientation session and business meeting which exposes student representatives to organized dentistry for the first time and allows the student voice to timely issues.
- ◆ **CDA Continuing Education Workshop** **\$15,000**
The Council on Education hosted a workshop entitled "Maintaining Professional Competence: The Fundamentals". Topics of discussion included: Attitudes of Professionals; Effectiveness of Programs; Strategies of Delivery; and Satisfying the Constituencies.
- ◆ **Multimedia/Interactive Courseware** **\$6,740**
Developed by Dr. A. Demirjian, University of Montreal, the Interactive Multimedia Courseware is used either for tutorial purposes or to present a large database to the dental student or practicing dentist.
- ◆ **Dalhousie Pediatric Research** **\$7,500**
Two generous anonymous donations supported pediatric dental education and research at Dalhousie University.
- ◆ **Lorne E. MacLachlan Endowment Grants** **\$15,000**
Four Canadian Dental Faculties received equal allocations towards education and teacher training in Removable and Maxillofacial Prosthodontics.
- ◆ **ISO Dental Standards Meeting in Italy** **\$3,000**
A Canadian delegation of dentists received support through the Ash Temple "Equity Grant" for the advancement of dentistry.
- ◆ **CDA Dental Awareness Program** **\$2,000**
Funds were allocated towards a Patient Communication Seminar - Pilot Project involving fourth year students, to be held at the University of Toronto.

Brève description des principaux projets subventionnés par le FCED:

- ◆ **Subventions aux facultés dentaires** **35 000 \$**
Subventions sans restrictions de 1 500 \$ et deux bourses d'études de premier cycle de 1 000 \$ chacune versées annuellement à chacune des dix facultés dentaires.
- ◆ **Sessions du FCED sur l'enseignement et l'administration** **43 000 \$**
Ces sessions de formation permettent, depuis 1986, aux enseignants dentaires d'améliorer leurs méthodes d'enseignement et aux administrateurs, anciens et nouveaux, d'évaluer et d'améliorer leurs capacités de gestion.
- ◆ **Colloque sur l'enseignement** **10 000 \$**
Le 35^e colloque annuel sur l'enseignement dentaire, qui a porté sur «L'apprentissage à partir des problèmes, une autre perspective d'éducation», a regroupé 40 participants de la profession et des professions connexes à travers le pays.
- ◆ **Système d'information dentaire des patients** **30 000 \$**
Collection de huit plaquettes sur les divers aspects de la santé dentaire à l'intention des patients. Le projet a aussi bénéficié de la générosité de Colgate-Palmolive.
- ◆ **Programme cliniques des étudiants** **10 225 \$**
L'appui financier de **Dentsply Canada Limited** permet aux représentants des dix facultés dentaires du pays de participer à cette activité du congrès de l'ADC.
- ◆ **Subventions N. A. Mancini et G. W. Barrett** **3 500 \$**
Cinq étudiants du premier cycle, qui avaient besoin d'aide financière, ont bénéficié de ces subventions en 1991.
- ◆ **Subvention Wrigley à la recherche dentaire** **10 000 \$**
Wrigley Canada Inc. offre annuellement des fonds pour aider aux étudiants dentaires qui participent à des projets de recherche dans le domaine de la biologie buccale, portant de préférence sur la salivation et la diminution de la carie dentaire.
- ◆ **Bourse de formation des professeurs** **25 500 \$**
Quinze candidats ont reçu des bourses en 1991, y compris celle de **Warner-Lambert Canada Inc.** versée à un professeur de médecine ou d'hygiène dentaires (2 500 \$) et la bourse **Henry Thornton** versée par **Dentsply Canada Ltd** au candidat le plus méritoire (1 000 \$).
- ◆ **Conférence ADC-FCED des étudiants dentaires** **11 000 \$**
Session annuelle d'orientation et assemblée des représentants des étudiants qui ont pour objet d'informer les étudiants au sujet de l'organisation dentaire et de leur permettre de formuler leur problèmes.
- ◆ **Atelier de l'ADC sur la formation continue** **15 000 \$**
Le Conseil de l'éducation a organisé un atelier sur «les éléments essentiels du main-tien de la compétence», qui a porté notamment sur les attitudes des professionnels, l'efficacité des programmes, les modalités d'enseignement et la satisfaction des personnes concernées.
- ◆ **Logiciel de cours interactif et multimédia** **6 740 \$**
Mis au point par le Dr A. Demirjian, à l'Université de Montréal, le logiciel de cours interactif et multimédia peut servir aux travaux pratiques ou à offrir une vaste base de données aux étudiants dentaires comme au dentiste en exercice.
- ◆ **Recherche pédiatrique à Dalhousie** **7 500 \$**
Deux généreux dons anonymes ont permis d'aider à l'éducation et à la recherche en dentisterie pédiatrique à l'université Dalhousie.
- ◆ **Bourse du Fonds de dotation L. E. MacLachlan** **15 000 \$**
Quatre facultés dentaires du pays ont reçu des allocations d'égale valeur pour la formation de professeurs en prothèses amovibles et maxillo-faciales.
- ◆ **Réunion de l'ISO en Italie sur les normes dentaires** **3 000 \$**
La délégation du Canada a reçu de l'aide, grâce au Ash Temple «Equity Grant» pour l'avancement de la dentisterie.
- ◆ **Programme de sensibilisation à la santé dentaire** **2 000 \$**
La somme a été affectée au projet pilote de séminaire sur la communication avec les patients, qui aura lieu à l'Université de Toronto à l'intention des étudiants de quatrième année.

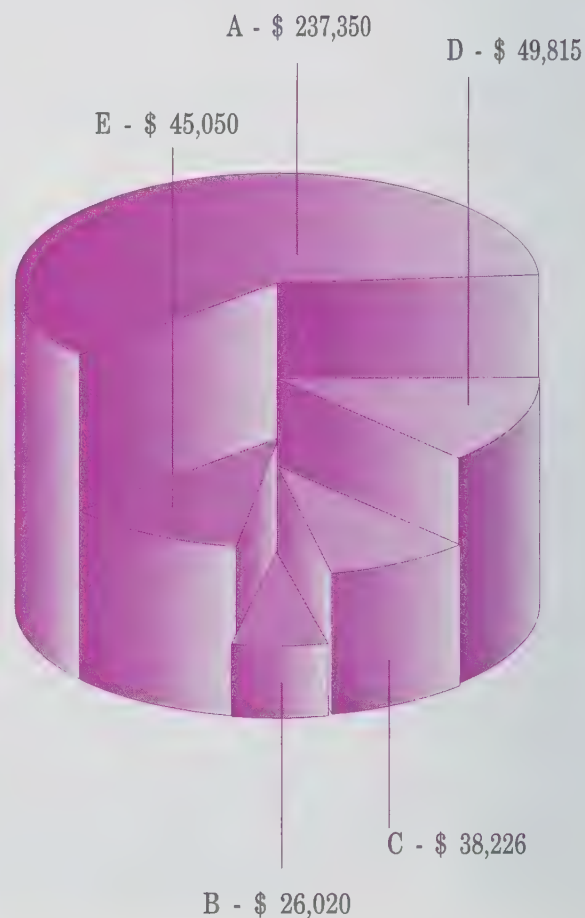
Income by Source/Revenus et provenance

A.	Business and industry Entreprises et industrie	\$ 117,831	29.7 %
B.	Dental Profession Profession dentaire	109,890	27.7 %
C.	Investment and Sundry Income Revenus de placements et de sources diverses	93,515	23.6 %
D.	Dental Organizations Organismes dentaires	34,375	8.7%
E.	In Memoriam Dons commémoratifs	7,675	1.9%
F.	Allied Dental Health Professionals and Organizations/Professionnels et organismes de la santé dentaire	5,123	1.3%
G.	Tributes and other contributions/ Hommages et autres contributions	2,036	0.5%
H.	Gifts to Endowment/Developing Funds /Dons aux fonds de dotation et de développement	26,020	6.6%
	TOTAL INCOME/ REVENUS TOTAL	\$396,465	100%



Allocation of Income /Distribution des revenus

A.	Programs and Support Programmes et soutien	\$237,354
B.	Endowment and Development Dons aux fonds de dotation et de développement	26,020
C.	Management and Public Infor- mation/Gérance et information publique	38,226
D.	Fund Raising/ Prélèvement de fonds	49,815
E.	Reserve/Réserve	45,050
	TOTAL ALLOCATION/ DISTRIBUTION TOTALE	\$396,465



Our records have been audited by Peat Marwick Thorne.
A copy of their report is available upon request.
Notre comptabilité a été vérifiée par Peat Marwick Thorne. On pourra se procurer
un exemplaire de leur rapport en faisant une demande à cet effet.

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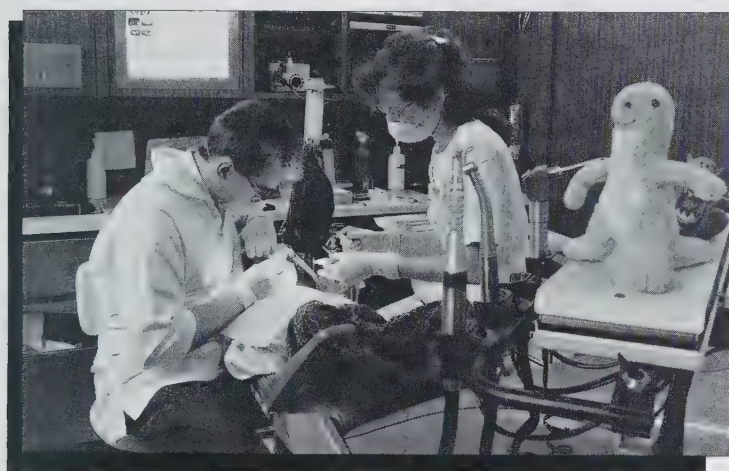
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